



1/78

Cellular Expression of  $\beta_2$ AR- $\beta$ gal  $\Delta\alpha$  Fusion Protein in C2 Clones  
(measured by anti- $\beta$ -gal ELISA)

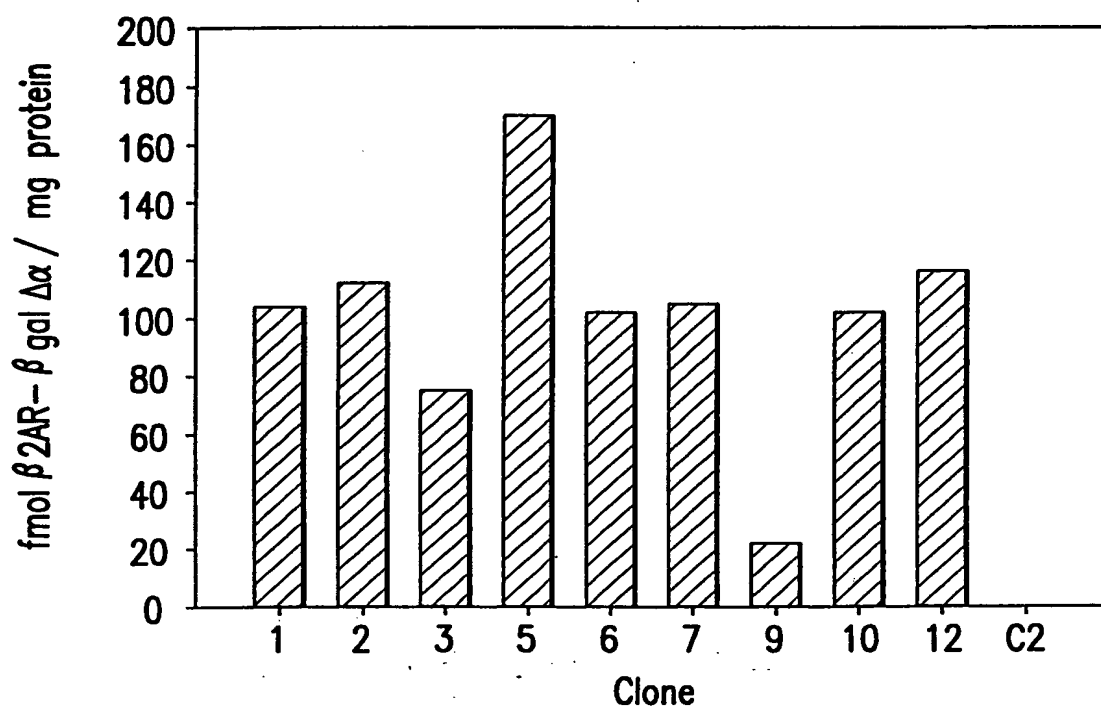


FIG. 1A

2/78

Cellular expression of  $\beta$ Arr- $\beta$ gal  $\Delta\omega$  fusion protein in C2 clones  
(measured by anti- $\beta$  gal ELISA)

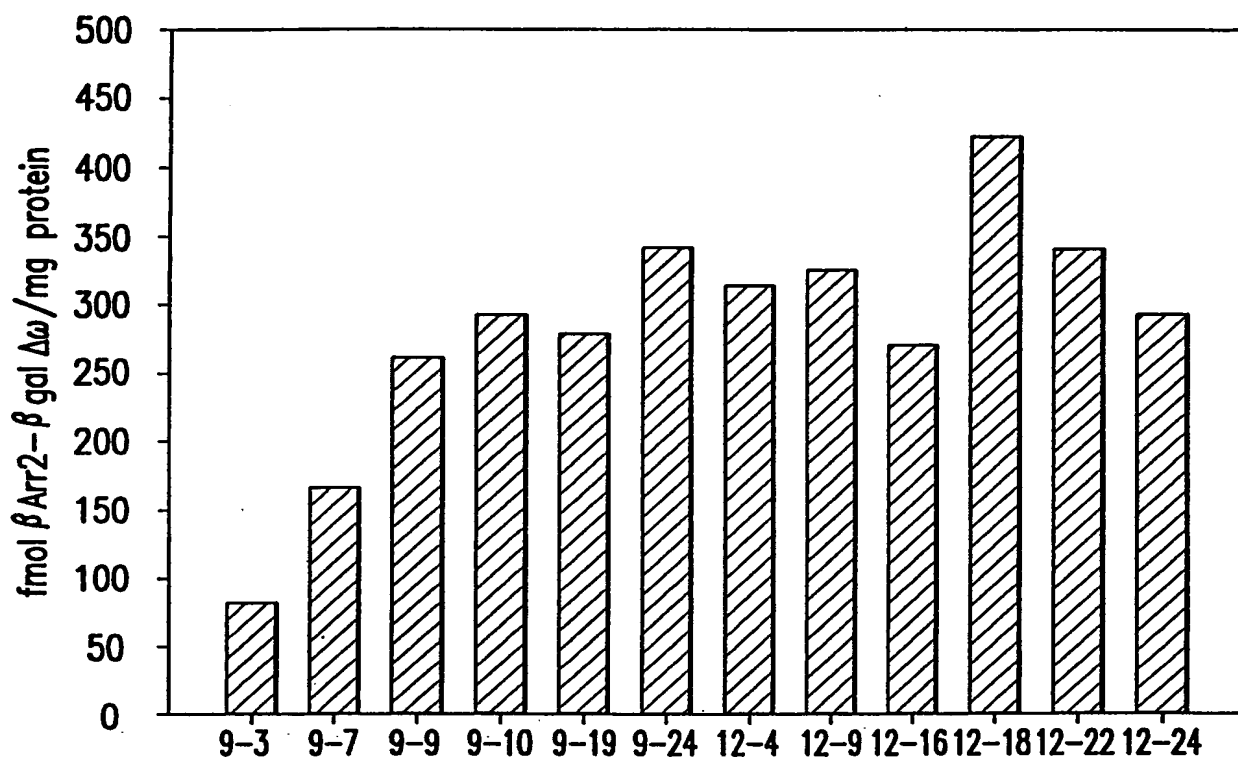


FIG. 1B



3/78

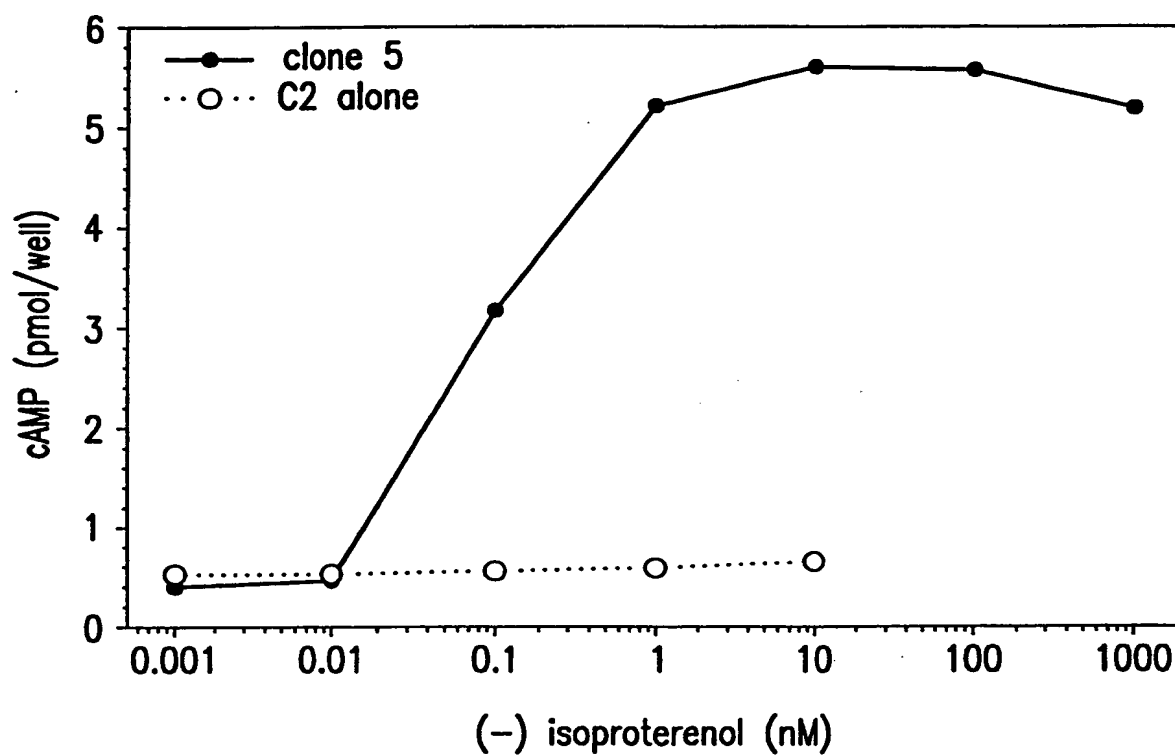
Agonist Stimulated cAMP Response in C2 Cells Expressing  $\beta 2AR-\beta gal\Delta\alpha$ 

FIG.2



4/78

$\beta$ -galactosidase Complementation as a Measurement for  $\beta_2$ AR- $\beta$ gal $\Delta\alpha$  interacting with  $\beta$ Arrestin2- $\beta$ gal $\Delta\omega$  upon agonist Stimulation

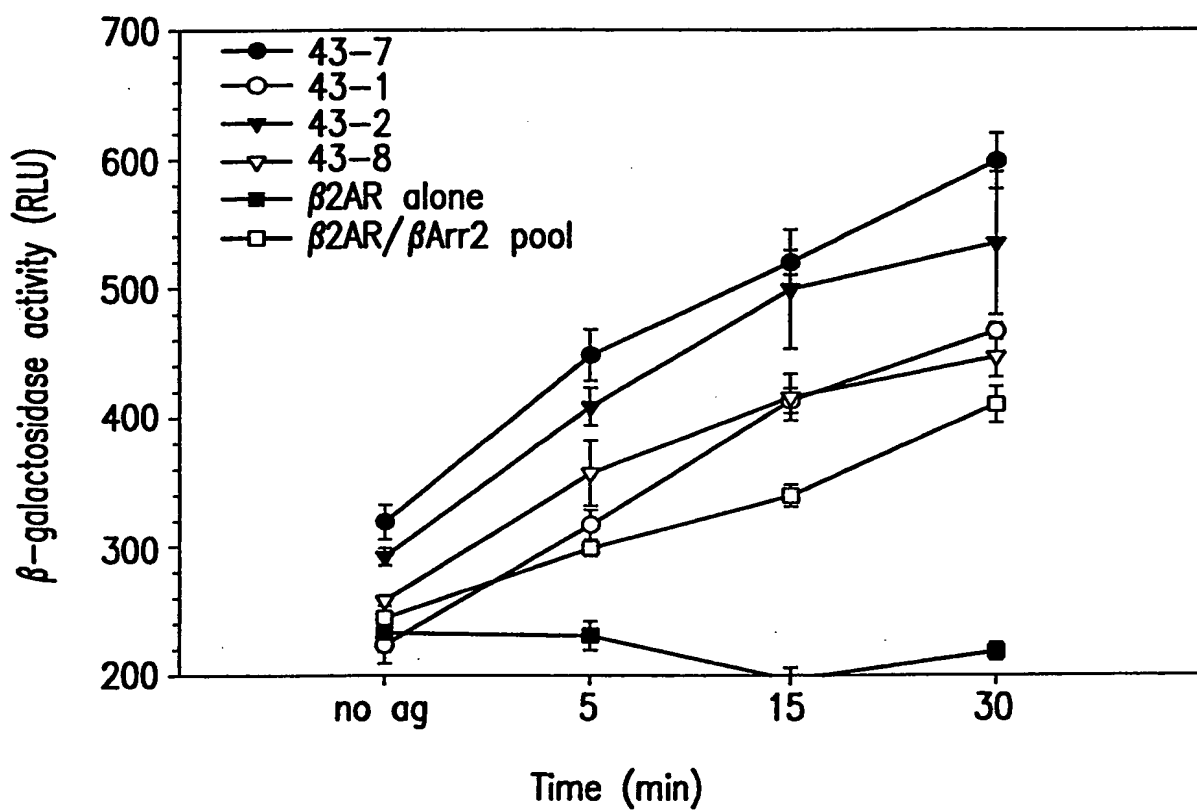


FIG. 3A

5/78

$\beta$ -galactosidase Complementation as a Measurement for  $\beta$ 2AR- $\beta$ gal $\Delta\alpha$   
Interaction with  $\beta$ Arrestin1- $\beta$ gal $\Delta\omega$  upon Agonist Stimulation

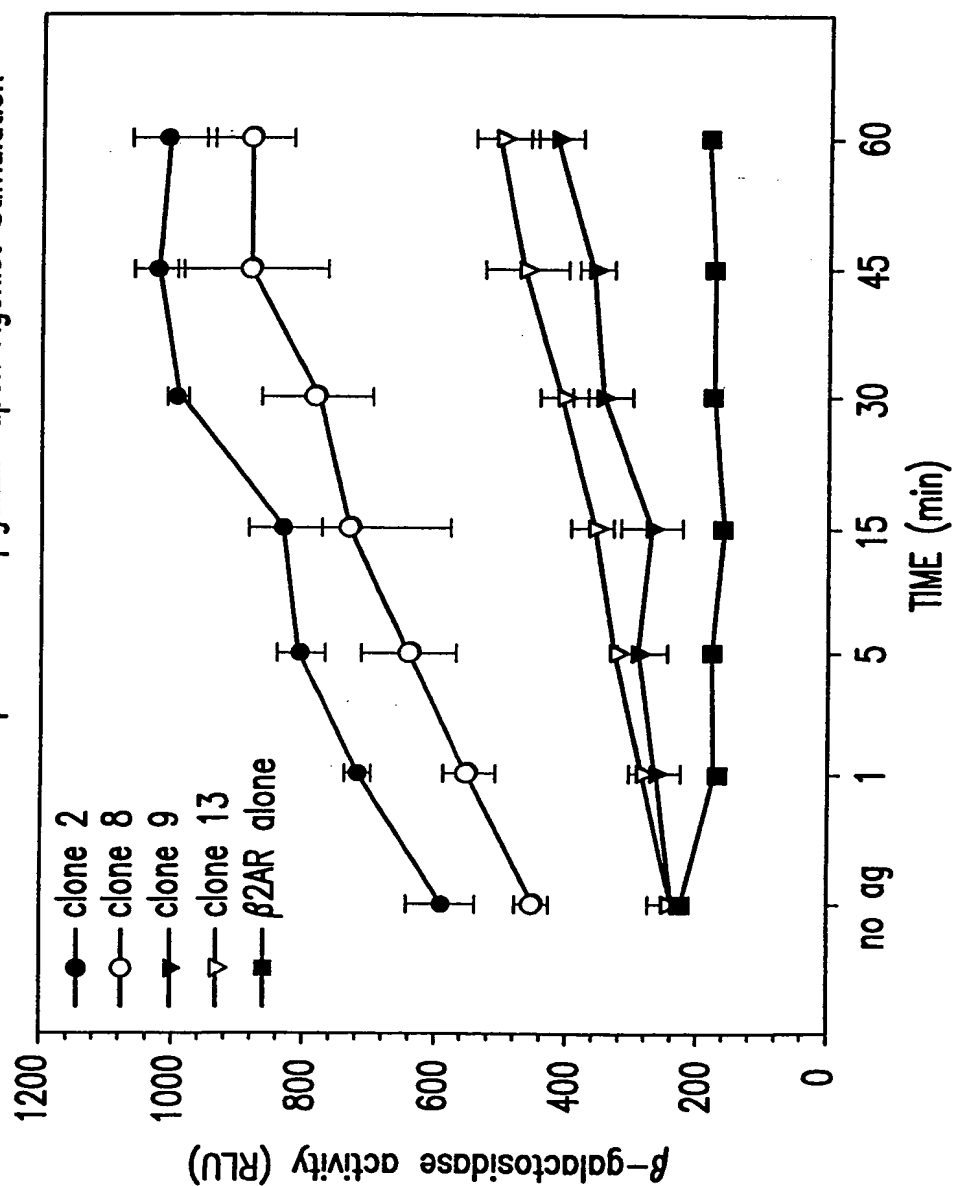


FIG. 3B

6/78

**$\beta$ -galactosidase Activity in Response to Agonist in C2 Cells  
Coexpressing  $\beta$ 2AR- $\beta$ gal $\Delta\alpha$  and  $\beta$ Arrestin2- $\beta$ gal $\Delta\omega$  Fusion Proteins**

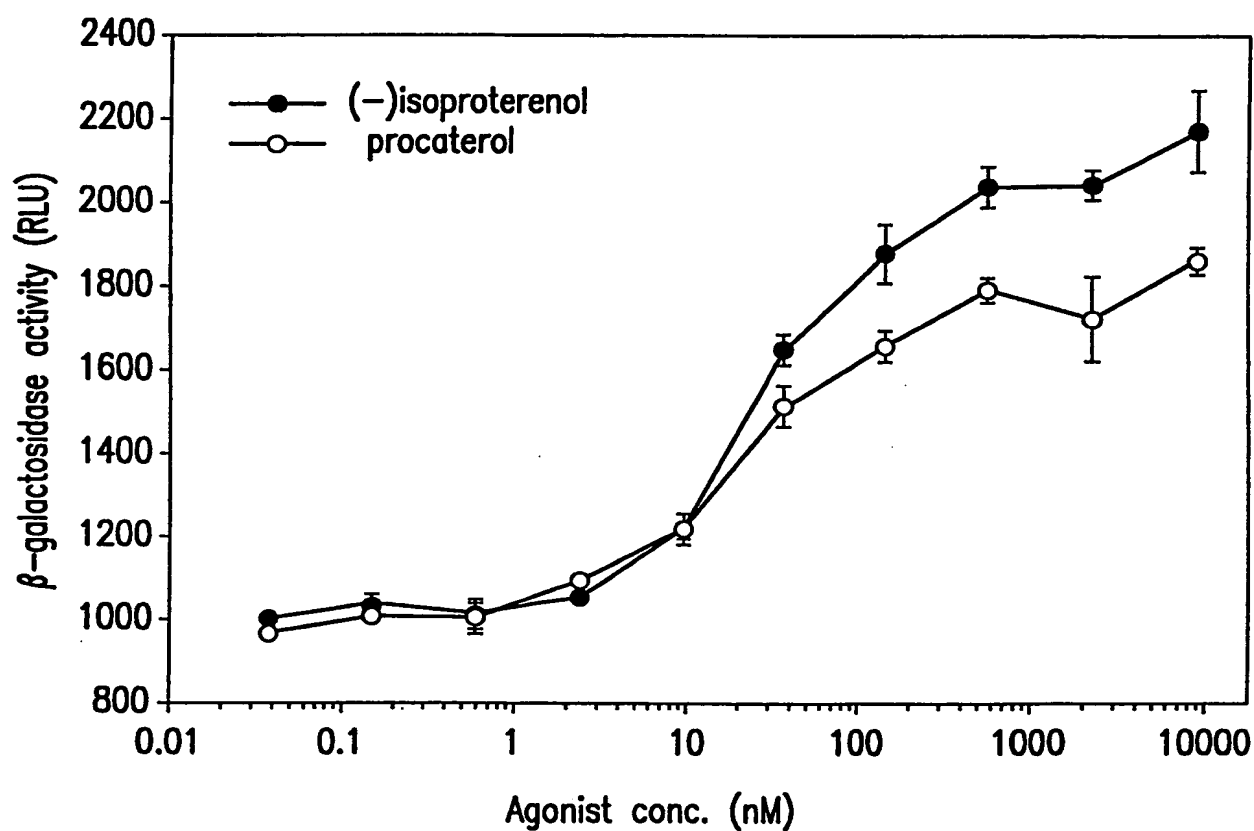


FIG. 4A

7/78

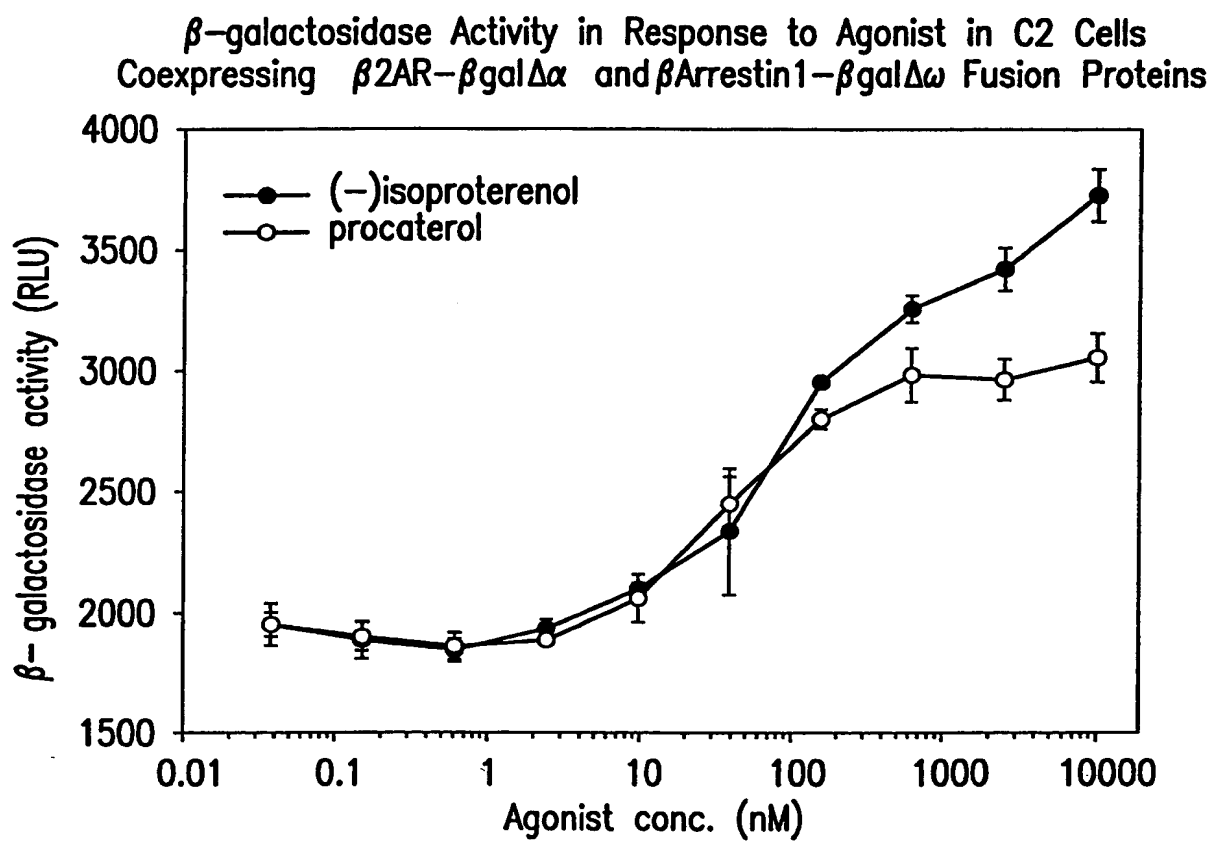


FIG. 4B



8/78

Inhibition of  $\beta$ -galactosidase activity in C2 Cells Coexpressing  $\beta$ 2AR - $\beta$ gal  $\Delta\alpha$  and  $\beta$ Arrestin2-  $\beta$ gal  $\Delta\omega$  Fusion Proteins

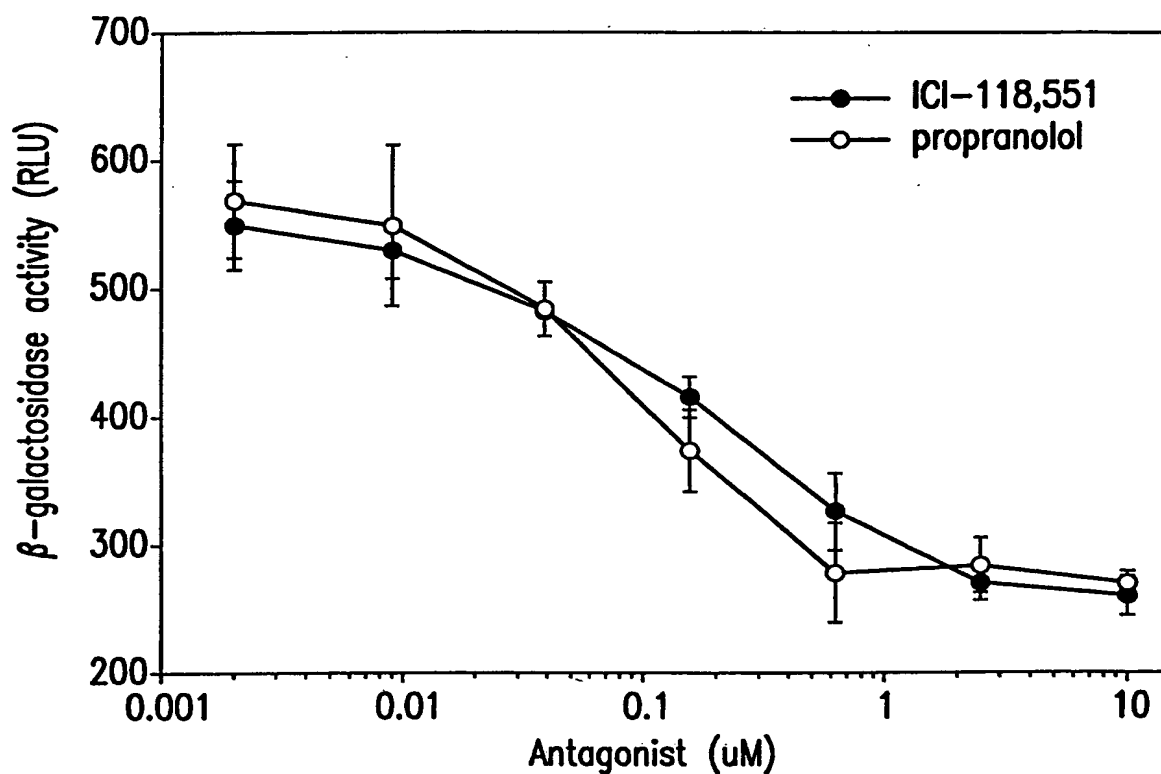


FIG. 5A





9/78

Antagonist Inhibition of  $\beta$ -galactosidase Activity in C2 Cells  
Coexpressing  $\beta$ 2AR- $\beta$ gal $\Delta\alpha$  and  $\beta$ Arrestin1- $\beta$ gal $\Delta\omega$  Fusion Proteins

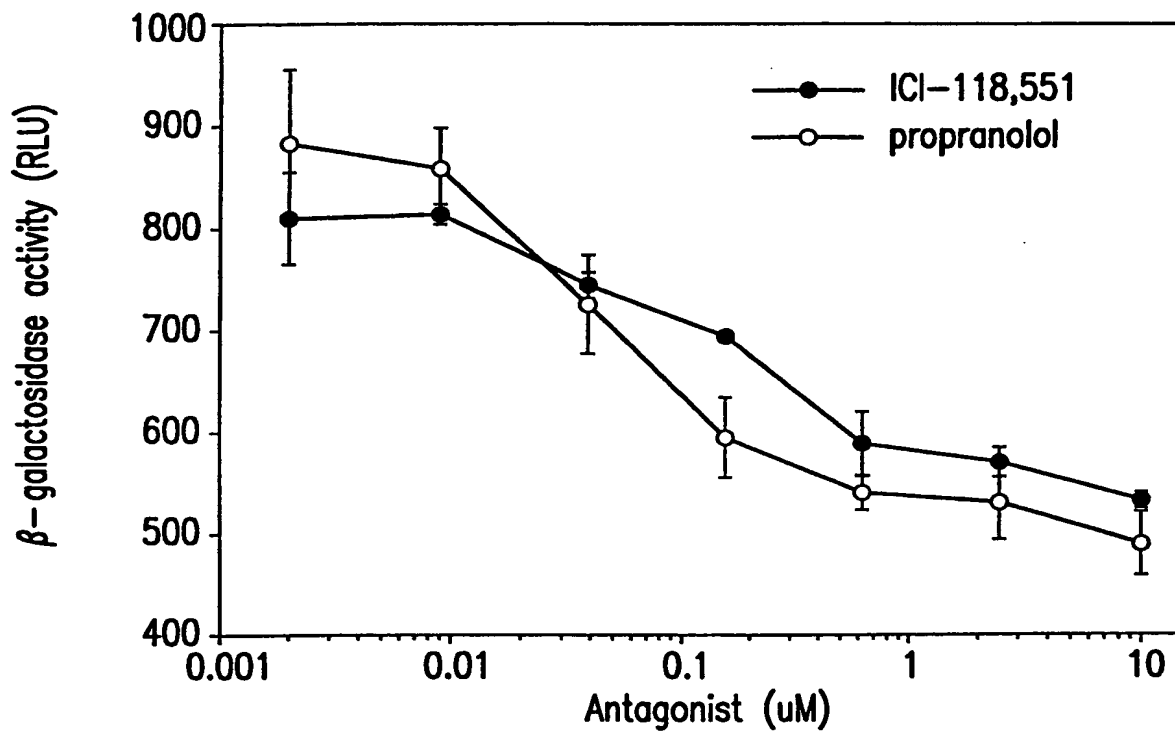


FIG. 5B

10/78

Agonist Stimulated cAMP Response in Clones or Pools of C2 Cells  
Coexpressing A2aR- $\beta$ gal  $\Delta\alpha$  and  
 $\beta$ Arrestin1-  $\beta$ gal  $\Delta\omega$  Fusion Proteins

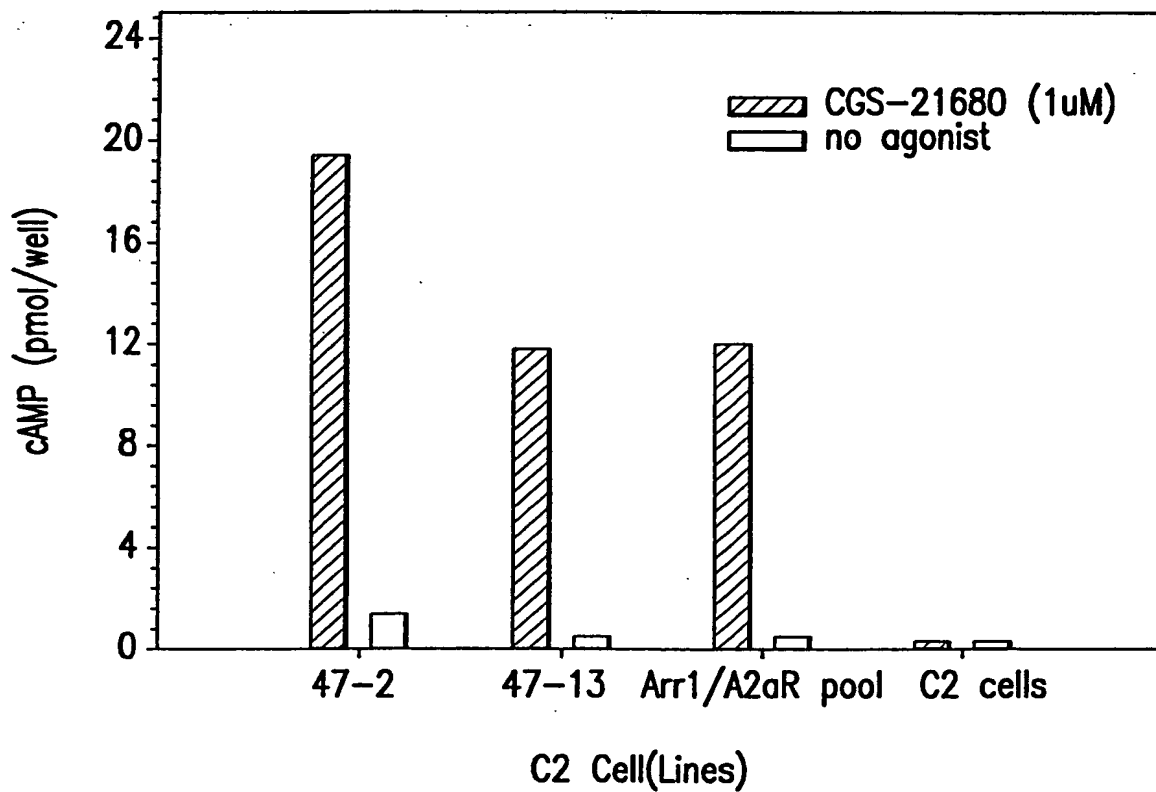


FIG.6

11/78

Agonist Stimulated cAMP Response in Clones or Pools of C2 Cells  
Expressing D1- $\beta$ gal  $\Delta\alpha$  and  $\beta$ Arrestin2- $\beta$ gal  $\Delta\omega$  Fusion Proteins

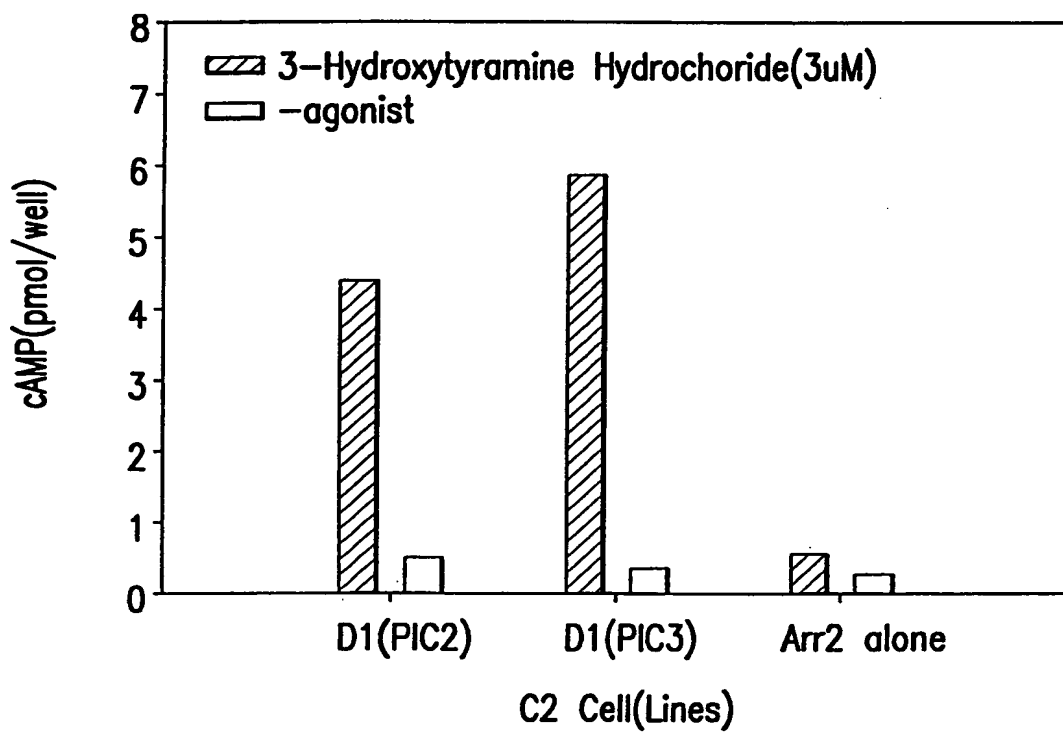


FIG. 7



12/78

$\beta_2AR$ - $\beta gal \Delta \omega$  and  $\beta arr2$ - $\beta gal \Delta \alpha$  Interaction in HEK293  
Clones in Response to Isoproterenol Treatment ( $1\mu M$ )

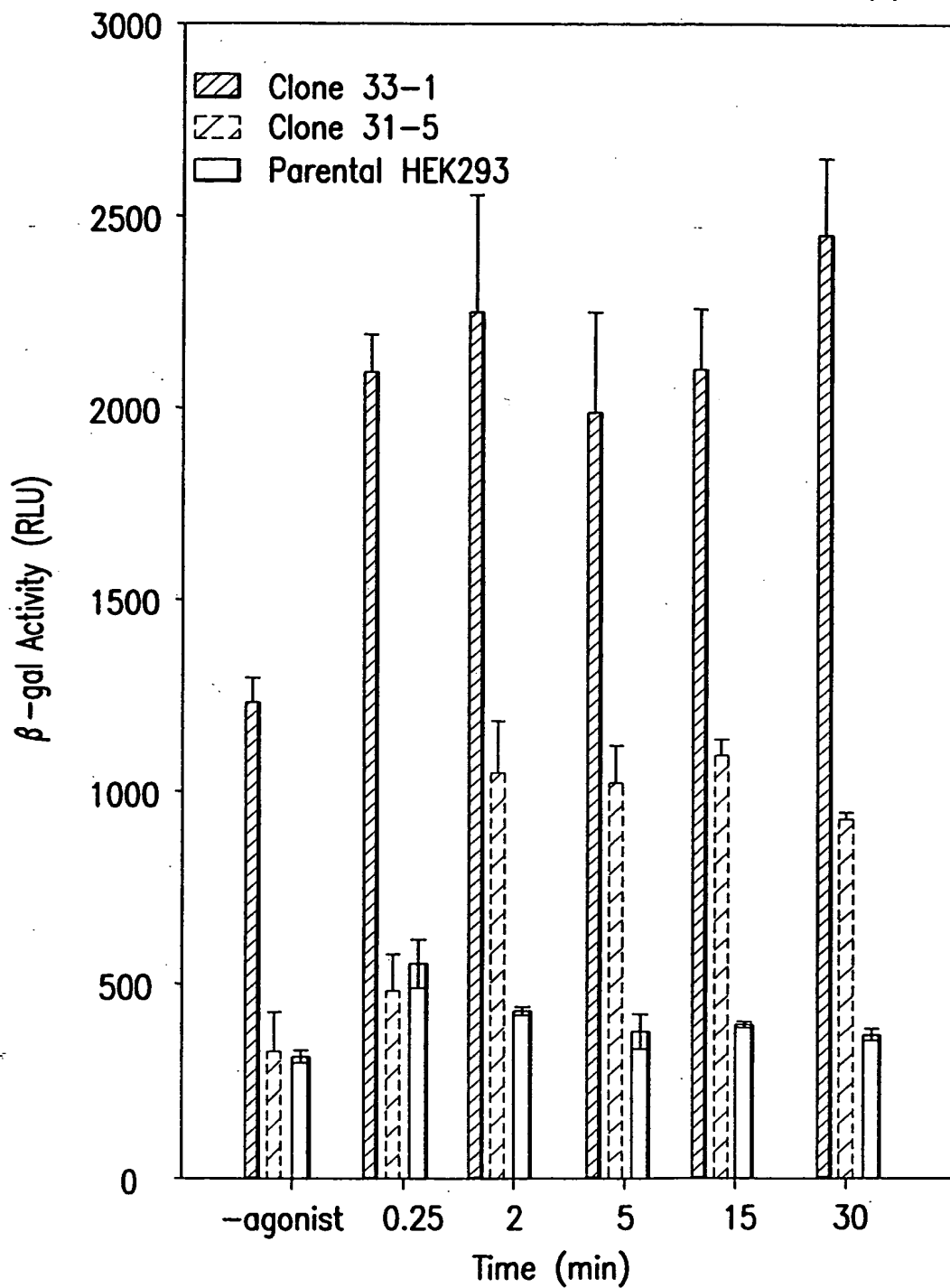


FIG. 8A



13/78

$\beta 2AR-\beta gal\Delta\alpha$  and  $\beta Arr1-\beta gal\Delta\omega$  Interaction in a CHO Pool  
in Response to Isoproterenol Treatment( $10\mu M$ )

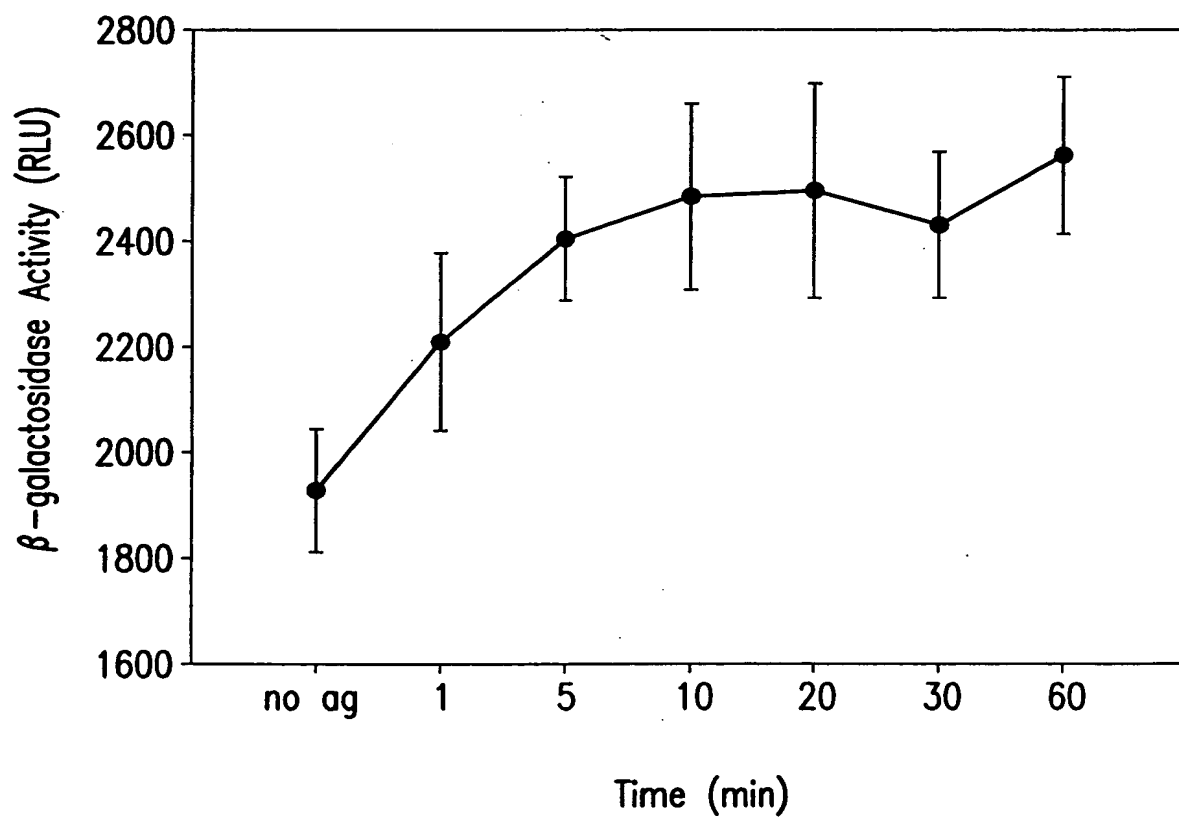


FIG. 8B



14/78

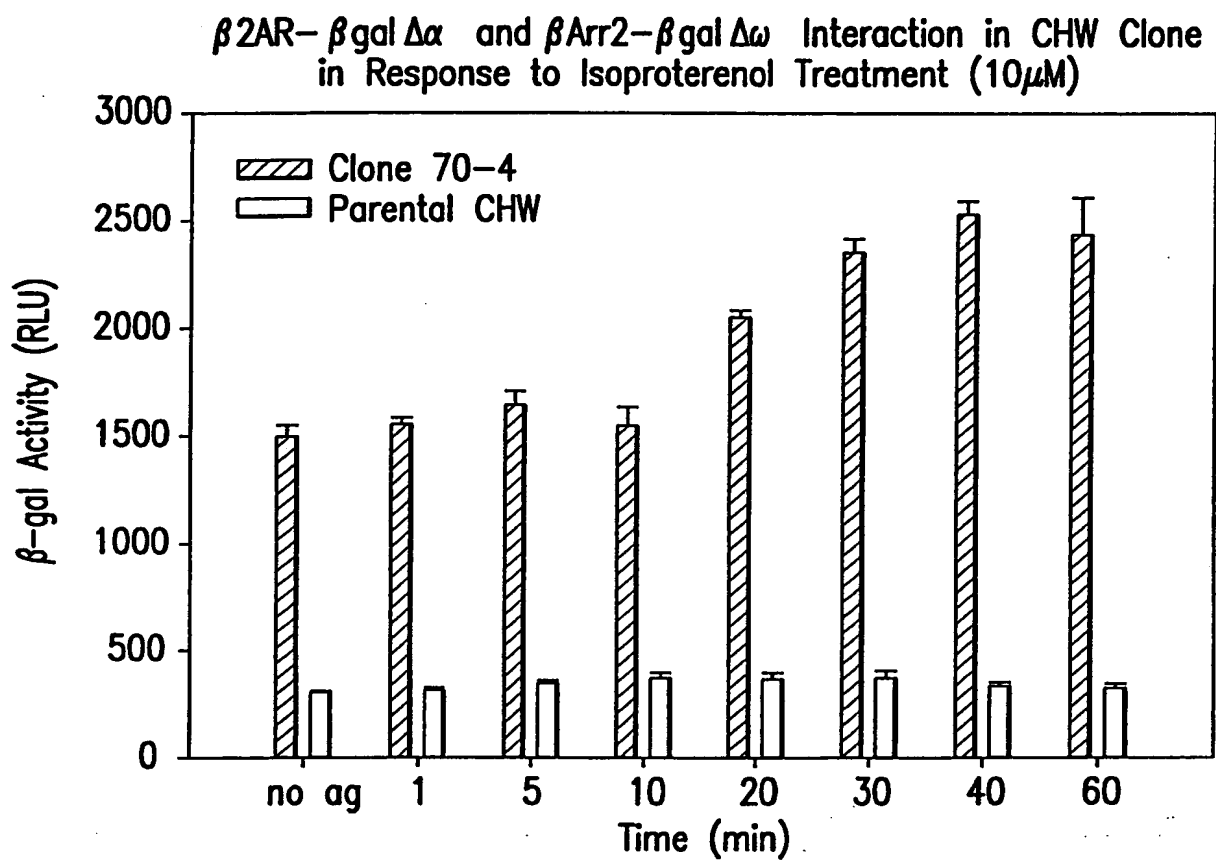


FIG. 8C



15/78

$\beta$ -galactosidase Complementation as a Measurement for  
Adrenergic Receptor Homodimerization in HEK 293 Cells  
Coexpressing  $\beta$ 2AR- $\beta$ gal  $\Delta\alpha$  and  $\beta$ 2AR- $\beta$ gal  $\Delta\omega$ .

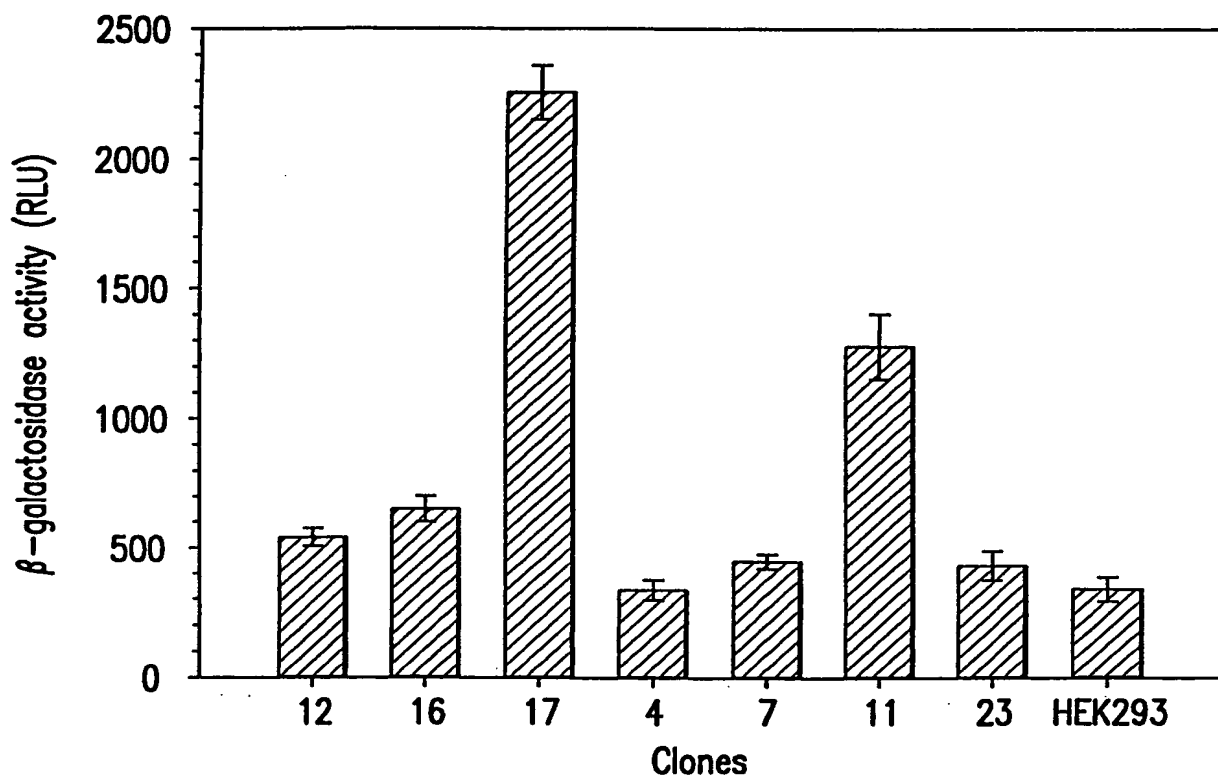


FIG. 9A



16/78

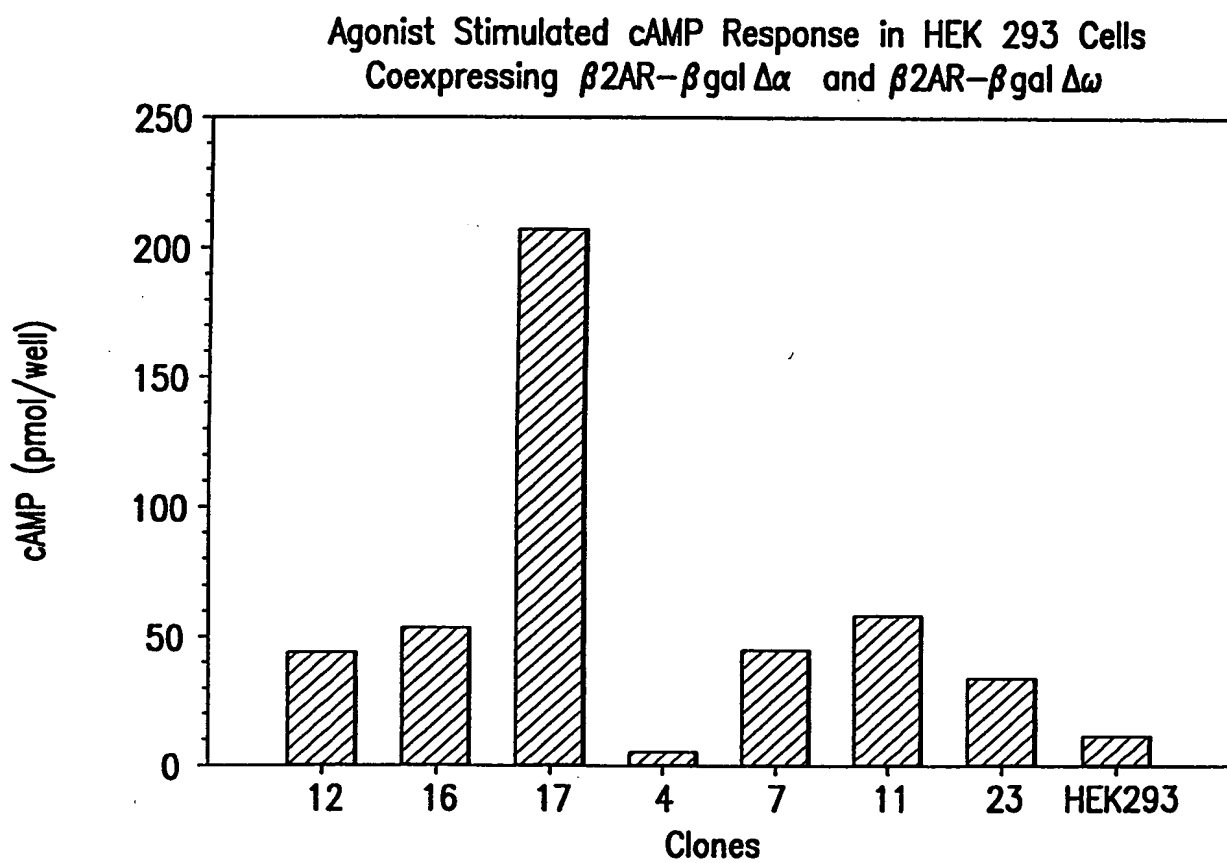


FIG. 9B





17/78

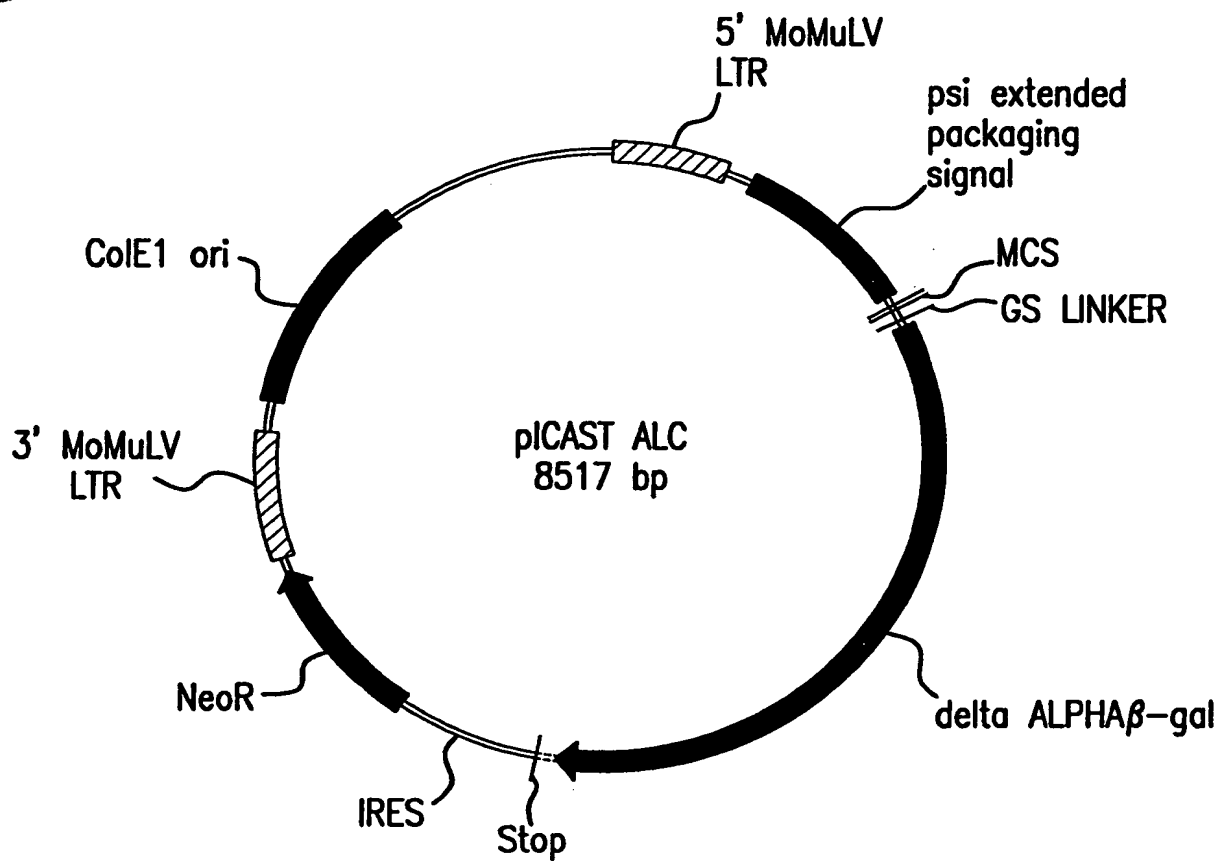


FIG.10A



18/78

pICAST ALC

1 CTGCAGCCTG AATATGGGCC AAACAGGATA TCTGTGGTAA GCAGTTCCTG  
 GACGTCGGAC TTATACCCGG TTTGTCCTAT AGACACCATT CGTCAAGGAC  
 51 CCCC GGCTCA GGGCCAAGAA CAGATGGAAC AGCTGAATAT GGGCCAAACA  
 GGGGCCGAGT CCCGTTCTT GTCTACCTTG TCGACTTATA CCCGTTTGT  
 101 GGATATCTGT GGTAAGCAGT TCCTGCCCCG GCTCAGGGCC AAGAACAGAT  
 CCTATAGACA CCATTGCTCA AGGACGGGGC CGAGTCCCGG TTCTTGTCTA  
 151 GGTCCCCAGA TGCGGTCCAG CCCTCAGCAG TTTCTAGAGA ACCATCAGAT  
 CCAGGGGTCT ACGCCAGGTC GGGAGTCGTC AAAGATCTCT TGGTAGTCTA  
 201 GTTTCAGGG TGCCCCAAGG ACCTGAAATG ACCCTGTGCC TTATTTGAAC  
 CAAAGGTCCC ACGGGGTTCC TGGACTTTAC TGGGACACGG AATAAACTTG  
 251 TAACCAATCA GTTCGCTTCT CGCTTCTGTT CGCGCGCTTC TGCTCCCCGA  
 ATTGGTTAGT CAAGCGAAGA GCGAAGACAA GCGCGCGAAG ACGAGGGGCT  
 301 GCTCAATAAA AGAGCCCACA ACCCCTCACT CGGGGCGCCA GTCCTCCGAT  
 CGAGTTATTT TCTCGGGTGT TGGGGAGTGA GCCCGCGGT CAGGAGGCTA  
 351 TGA CTGAGTC GCCCGGGTAC CCGTGTATCC AATAAACCTT CTTGCAGTTG  
 ACTGACTCAG CGGGCCCATG GGCACATAGG TTATTTGGGA GAACGTCAAC  
 401 CATCCGACTT GTGGTCTCGC TGTTCTTGG GAGGGTCTCC TCTGAGTGAT  
 GTAGGCTGAA CACCAGAGCG ACAAGGAACC CTCCCAGAGG AGACTCACTA  
 451 TGA CTACCG TCAGCGGGGG TCTTTCATTT GGGGGCTCGT CCGGGATCGG  
 ACTGATGGGC AGTCGCCCC AGAAAGTAAA CCCCCGAGCA GGCCCTAGCC  
 501 GAGACCCCTG CCCAGGGACC ACCGACCCAC CACCGGGAGG CAAGCTGGCC  
 CTCTGGGGAC GGGTCCCTGG TGGCTGGGTG GTGGCCCTCC GTTCGACCGG  
 551 AGCAACTTAT CTGTGTCTGT CCGATTGTCT AGTGTCTATG ACTGATTTTA  
 TCGTTGAATA GACACAGACA GGCTAACAGA TCACAGATAC TGA TAAAAT  
 601 TCGCCTGCG TCGGTACTAG TTAGCTAACT AGCTCTGTAT CTGGCGGACC  
 ACGCGGACGC AGCCATGATC AATCGATTGA TCGAGACATA GACCGCCTGG

FIG. 10B



19/78

pICAST ALC

651 CGTGGTGGAA CTGACGAGTT CTGAACACCC GGCCGCAACC CTGGGAGACG  
GCACCACCTT GACTGCTCAA GACTTGTGGG CCGGCGTTGG GACCCTCTGC

701 TCCCAGGGAC TTTGGGGGCC GTTTTTGTGG CCCGACCTGA GGAAGGGAGT  
AGGGTCCCTG AAACCCCGG CAAAAACACC GGGCTGGACT CCTTCCCTCA

751 CGATGTGGAA TCCGACCCCG TCAGGATATG TGGTTCTGGT AGGAGACGAG  
GCTACACCTT AGGCTGGGGC AGTCCTATAC ACCAAGACCA TCCTCTGCTC

801 AACCTAAAAC AGTTCCCGCC TCCGTCTGAA TTTTGTCTT CGGTTTGGAA  
TTGGATTTTG TCAAGGGCGG AGGCAGACTT AAAAACGAAA GCCAAACCTT

851 CCGAAGCCGC GCGTCTTGTC TGCTGCAGCA TCGTTCTGTG TTGTCTCTGT  
GGCTTCGGCG CGCAGAACAG ACGACGTCGT AGCAAGACAC AACAGAGACA

901 CTGACTGTGT TTCTGTATTT GTCTGAAAAT TAGGGCCAGA CTGTTACCAC  
GACTGACACA AAGACATAAA CAGACTTTTA ATCCCGGTCT GACAATGGTG

951 TCCCTTAAGT TTGACCTTAG GTAAGTGGAA AGATGTCGAG CGGCTCGCTC  
AGGGAATTCA AACTGGAATC CATTGACCTT TCTACAGCTC GCCGAGCGAG

1001 ACAACCAGTC GGTAGATGTC AAGAAGAGAC GTTGGGTTAC CTTCTGCTCT  
TGTTGGTCAG CCATCTACAG TTCTTCTCTG CAACCCAATG GAAGACGAGA

1051 GCAGAATGGC CAACCTTTAA CGTCGGATGG CCGCGAGACG GCACCTTTAA  
CGTCTTACCG GTTGGAAATT GCAGCCTACC GGCCTCTGCTG CGTGGAAATT

1101 CCGAGACCTC ATCACCAGG TTAAGATCAA GGTCTTTTCA CCTGGCCCGC  
GGCTCTGGAG TAGTGGGTCC AATTCTAGTT CCAGAAAAGT GGACCGGGCG

1151 ATGGACACCC AGACCAGGTC CCCTACATCG TGACCTGGGA AGCCTTGGCT  
TACCTGTGGG TCTGGTCCAG GGGATGTAGC ACTGGACCCT TCGGAACCGA

1201 TTTGACCCCC CTCCCTGGGT CAAGCCCTTT GTACACCCTA AGCCTCCGCC  
AAACTGGGGG GAGGGACCCA GTTCGGGAAA CATGTGGGAT TCGGAGGCGG

1251 TCCTCTTCCT CCATCCGCCC CGTCTCTCCC CCTTGAACCT CTCGTTTGA  
AGGAGAAGGA GGTAGGCGGG GCAGAGAGGG GGAACCTGGA GGAGCAAGCT

FIG. 10C



20/78

## pICAST ALC

1301 CCCC GCCTCG ATCCTCCCTT TATCCAGCCC TCACTCCTTC TCTAGGCGCC  
 GGGGCGGAGC TAGGAGGGAA ATAGGTCGGG AGTGAGGAAG AGATCCGCGG  
  
 1351 GGCCGCTCTA GCCCATTAAT ACGACTCACT ATAGGGCGAT TCGAATCAGG  
 CCGGCGAGAT CGGGTAATTA TGCTGAGTGA TATCCCGCTA AGCTTAGTCC  
  
 1401 CCTTGGCGCG CCGGATCCTT AATTAAGCGC AATTGGGAGG TGGCGGTAGC  
 GGAACCGCGC GGCCTAGGAA TTAATTCGCG TTAACCTCC ACCGCCATCG  
  
 +2 M G V I T D S L A V V A R T D  
 ]-----  
 1451 CTCGAGATGG GCGTGATTAC GGATTCAGTG GCCGTCGTGG CCCGCACCGA  
 GAGCTCTACC CGCACTAATG CCTAAGTGAC CGGCAGCACC GGGCGTGGCT  
  
 +2 R P S Q Q L R S L N G E W R F A  
 -----  
 1501 TCGCCCTTCC CAACAGTTAC GCAGCCTGAA TGGCGAATGG CGCTTTGCCT  
 AGCGGGAAGG GTTGTCAATG CGTCGGACTT ACCGCTTACC GCGAAACGGA  
  
 +2 W F P A P E A V P E S W L E C D L  
 -----  
 1551 GGTTTCCGGC ACCAGAAGCG GTGCCGAAA GCTGGCTGGA GTGCGATCTT  
 CCAAAGGCCG TGGTCTTCGC CACGGCCTTT CGACCGACCT CACGCTAGAA  
  
 +2 P E A D T V V V P S N W Q M H G Y  
 -----  
 1601 CCTGAGGCCG ATACTGTCGT CGTCCCCTCA AACTGGCAGA TGCACGGTTA  
 GGA CTCCGGC TATGACAGCA GCAGGGGAGT TTGACCGTCT ACGTGCCAAT  
  
 +2 D A P I Y T N V T Y P I T V N P  
 -----  
 1651 CGATGCGCCC ATCTACACCA ACGTGACCTA TCCCATTACG GTCAATCCGC  
 GCTACGCGGG TAGATGTGGT TGCACTGGAT AGGGTAATGC CAGTTAGGCG  
  
 +2 P F V P T E N P T G C Y S L T F N  
 -----  
 1701 CGTTTGTTCC CACGGAGAAT CCGACGGGTT GTTACTCGCT CACATTTAAT  
 GCAAACAAGG GTGCCTCTTA GGCTGCCCAA CAATGAGCGA GTGTAAATTA

FIG.10D



21/78

## pICAST ALC

+2     V D E S   W L Q   E G Q   T R I I   F D G  
-----  
1751   GTTGATGAAA GCTGGCTACA GGAAGGCCAG ACGCGAATTA TTTTGTATGG  
CAACTACTTT CGACCGATGT CTTCCGGTC TGCCTTAAT AAAA ACTACC

+2     V N S   A F H L   W C N   G R W   V G Y  
-----  
1801   CGTAACTCG GCGTTTCATC TGTGGTGCAA CGGGCGCTGG GTCGGTTACG  
GCAATTGAGC CGCAAAGTAG ACACCACGTT GCCCGCGACC CAGCCAATGC

+2     G Q D S   R L P   S E F D   L S A   F L R  
-----  
1851   GCCAGGACAG TCGTTTGCCG TCTGAATTTG ACCTGAGCGC ATTTTACGC  
CGGTCCTGTC AGCAAACGGC AGACTTAAAC TGGACTCGCG TAAAAATGCG

+2     A G E N   R L A   V M V   L R W S   D G S  
-----  
1901   GCCGGAGAAA ACCGCCTCGC GGTGATGGTG CTGCGCTGGA GTGACGGCAG  
CGGCCTCTTT TGGCGGAGCG CCACTACCAC GACGCGACCT CACTGCCGTC

+2     Y L E   D Q D M   W R M   S G I   F R D  
-----  
1951   TTATCTGGAA GATCAGGATA TGTGGCGGAT GAGCGGCATT TTCCGTGACG  
AATAGACCTT CTAGTCCTAT ACACCGCCTA CTCGCCGTAA AAGGCACTGC

+2     V S L L   H K P   T T Q I   S D F   H V A  
-----  
2001   TCTCGTTGCT GCATAAACCG ACTACACAAA TCAGCGATTT CCATGTTGCC  
AGAGCAACGA CGTATTTGGC TGATGTGTTT AGTCGCTAAA GGTACAACGG

+2     T R F N   D D F   S R A   V L E A   E V Q  
-----  
2051   ACTCGCTTTA ATGATGATTT CAGCCGCGCT GTACTGGAGG CTGAAGTTCA  
TGAGCGAAAT TACTACTAAA GTCGGCGCGA CATGACCTCC GACTTCAAGT

FIG.10E



22/78

pICAST ALC

```

+2      M C G E L R D Y L R V T V S L W
-----
2101    GATGTGCGGC GAGTTGCGTG ACTACCTACG GGTAACAGTT TCTTTATGGC
        CTACACGCCG CTCAACGCAC TGATGGATGC CCATTGTCAA AGAAATACCG

+2      Q G E T Q V A S G T A P F G G E I
-----
2151    AGGGTGAAAC GCAGGTCGCC AGCGGCACCG CGCCTTTCGG CGGTGAAATT
        TCCCACTTTG CGTCCAGCGG TCGCCGTGGC GCGGAAAGCC GCCACTTTAA

+2      I D E R G G Y A D R V T L R L N V
-----
2201    ATCGATGAGC GTGGTGGTTA TGCCGATCGC GTCACACTAC GTCTGAACGT
        TAGCTACTCG CACCACCAAT ACGGCTAGCG CAGTGTGATG CAGACTTGCA

+2      E N P K L W S A E I P N L Y R A
-----
2251    CGAAAACCCG AAAGTGTGGA GCGCCGAAAT CCCGAATCTC TATCGTGCGG
        GCTTTTGGGC TTTGACACCT CGCGGCTTTA GGGCTTAGAG ATAGCACGCC

+2      V V E L H T A D G T L I E A E A C
-----
2301    TGGTTGAACT GCACACCGCC GACGGCACGC TGATTGAAGC AGAAGCCTGC
        ACCAACTTGA CGTGTGGCGG CTGCCGTGCG ACTAACTTCG TCTTCGGACG

+2      D V G F R E V R I E N G L L L L N
-----
2351    GATGTCGGTT TCCGCGAGGT GCGGATTGAA AATGGTCTGC TGCTGCTGAA
        CTACAGCCAA AGGCGCTCCA CGCCTAACTT TTACCAGACG ACGACGACTT

+2      G K P L L I R G V N R H E H H P
-----
2401    CGGCAAGCCG TTGCTGATTC GAGGCGTTAA CCGTCACGAG CATCATCCTC
        GCCGTTCCGGC AACGACTAAG CTCCGCAATT GGCAGTGCTC GTAGTAGGAG

```

FIG.10F



23/78

pICAST ALC

+2 L H G Q V M D E Q T M V Q D I L L  
-----  
2451 TGCATGGTCA GGTCATGGAT GAGCAGACGA TGGTGCAGGA TATCCTGCTG  
ACGTACCACT CCACTACCTA CTCGTCTGCT ACCACGTCCT ATAGGACGAC

+2 M K Q N N F N A V R C S H Y P N H  
-----  
2501 ATGAAGCAGA ACAACTTTAA CGCCGTGCGC TGTTGCGATT ATCCGAACCA  
TACTTCGTCT TGTTGAAATT GCGGCACGCG ACAAGCGTAA TAGGCTTGCT

+2 P L W Y T L C D R Y G L Y V V D  
-----  
2551 TCCGCTGTGG TACACGCTGT GCGACCGCTA CGGCCTGTAT GTGGTGGATG  
AGGCGACACC ATGTGCGACA CGCTGGCGAT GCCGGACATA CACCACCTAC

+2 E A N I E T H G M V P M N R L T D  
-----  
2601 AAGCCAATAT TGAAACCCAC GGCATGGTGC CAATGAATCG TCTGACCGAT  
TTCGGTTATA ACTTTGGGTG CCGTACCACG GTTACTTAGC AGACTGGCTA

+2 D P R W L P A M S E R V T R M V Q  
-----  
2651 GATCCGCGCT GGCTACCGGC GATGAGCGAA CGCGTAACGC GAATGGTGCA  
CTAGGCGCGA CCGATGGCCG CTACTCGCTT GCGCATTGCG CTTACCACGT

+2 R D R N H P S V I I W S L G N E  
-----  
2701 GCGCGATCGT AATCACCCGA GTGTGATCAT CTGGTCGCTG GGGAATGAAT  
CGCGCTAGCA TTAGTGGGCT CACACTAGTA GACCAGCGAC CCCTTACTTA

+2 S G H G A N H D A L Y R W I K S V  
-----  
2751 CAGGCCACGG CGCTAATCAC GACGCGCTGT ATCGCTGGAT CAAATCTGTC  
GTCCGGTGCC GCGATTAGTG CTGCGCGACA TAGCGACCTA GTTATAGACAG

FIG.10G



24/78

## pICAST ALC

+2     D P S R P V Q Y E G G G A D T T A  
-----  
2801   GATCCTTCCC GCCCGGTGCA GTATGAAGGC GGCGGAGCCG ACACCACGGC  
       CTAGGAAGGG CGGGCCACGT CATACTTCCG CCGCCTCGGC TGTGGTGCCG

+2     T D I I C P M Y A R V D E D Q P  
-----  
2851   CACCGATATT ATTTGCCCCG TGTACGCGCG CGTGGATGAA GACCAGCCCT  
       GTGGCTATAA TAAACGGGCT ACATGCGCGC GCACCTACTT CTGGTCGGGA

+2     F P A V P K W S I K K W L S L P G  
-----  
2901   TCCCGGCTGT GCCGAAATGG TCCATCAAAA AATGGCTTTC GCTACCTGGA  
       AGGGCCGACA CGGCTTTACC AGGTAGTTTT TTACCGAAAG CGATGGACCT

+2     E T R P L I L C E Y A H A M G N S  
-----  
2951   GAGACGCGCC CGCTGATCCT TTGCGAATAC GCCCAGCGCA TGGGTAACAG  
       CTCTGCGCGG GCGACTAGGA AACGCTTATG CGGGTGCGCT ACCCATTGTC

+2     L G G F A K Y W Q A F R Q Y P R  
-----  
3001   TCTTGGCGGT TTCGCTAAAT ACTGGCAGGC GTTTCGTCAG TATCCCCGTT  
       AGAACCGCCA AAGCGATTTA TGACCGTCCG CAAAGCAGTC ATAGGGGCAA

+2     L Q G G F V W D W V D Q S L I K Y  
-----  
3051   TACAGGGCGG CTTCGTCTGG GACTGGGTGG ATCAGTCGCT GATTAAATAT  
       ATGTCCCGCC GAAGCAGACC CTGACCCACC TAGTCAGCGA CTAATTTATA

+2     D E N G N P W S A Y G G D F G D T  
-----  
3101   GATGAAAACG GCAACCCGTG GTCGGCTTAC GGCGGTGATT TTGGCGATAC  
       CTACTTTTGC CGTTGGGCAC CAGCCGAATG CCGCCACTAA AACCGCTATG

FIG.10H





25/78

pICAST ALC

+2     P   N   D   R   Q   F   C   M   N   G   L   V   F   A   D   R  
-----  
3151   GCGAACGAT CGCCAGTTCT GTATGAACGG TCTGGTCTTT GCCGACCGCA  
CGGCTTGCTA GCGGTCAAGA CATACTTGCC AGACCAGAAA CGGCTGGCGT

+2     T   P   H   P   A   L   T   E   A   K   H   Q   Q   Q   F   F   Q  
-----  
3201   CGCCGCATCC AGCGCTGACG GAAGCAAAAC ACCAGCAGCA GTTTTTCCAG  
GCGGCGTAGG TCGCGACTGC CTTCGTTTTG TGGTCGTCGT CAAAAGGTC

+2     F   R   L   S   G   Q   T   I   E   V   T   S   E   Y   L   F   R  
-----  
3251   TTCCGTTTAT CCGGGCAAAC CATCGAAGTG ACCAGCGAAT ACCTGTTCCG  
AAGGCAAATA GGCCCGTTTG GTAGCTTCAC TGGTCGCTTA TGGACAAGGC

+2     H   S   D   N   E   L   L   H   W   M   V   A   L   D   G   K  
-----  
3301   TCATAGCGAT AACGAGCTCC TGCCTGGAT GGTGGCGCTG GATGGTAAGC  
AGTATCGCTA TTGCTCGAGG ACGTGACCTA CCACCGCGAC CTACCATTG

+2     P   L   A   S   G   E   V   P   L   D   V   A   P   Q   G   K   Q  
-----  
3351   CGCTGGCAAG CGGTGAAGTG CCTCTGGATG TCGCTCCACA AGGTAAACAG  
GCGACCGTTC GCCACTTCAC GGAGACCTAC AGCGAGGTGT TCCATTTGTC

+2     L   I   E   L   P   E   L   P   Q   P   E   S   A   G   Q   L   W  
-----  
3401   TTGATTGAAC TGCCTGAACT ACCGCAGCCG GAGAGCGCCG GGCAACTCTG  
AACTAACTTG ACGGACTTGA TGGCGTCGGC CTCTCGCGGC CCGTTGAGAC

+2     L   T   V   R   V   V   Q   P   N   A   T   A   W   S   E   A  
-----  
3451   GCTCACAGTA CGCGTAGTGC AACCGAACGC GACCGCATGG TCAGAAGCCG  
CGAGTGTCAT GCGCATCACG TTGGCTTGCG CTGGCGTACC AGTCTTCGGC

FIG.10I



26/78

## pICAST ALC

+2     G H I S A W Q Q W R L A E N L S V  
-----  
3501   GGCACATCAG CGCCTGGCAG CAGTGGCGTC TGGCGGAAAA CCTCAGTGTG  
       CCGTGTAGTC GCGGACCGTC GTCACCGCAG ACCGCCTTTT GGAGTCACAC

+2     T L P A A S H A I P H L T T S E M  
-----  
3551   ACGCTCCCCG CCGCGTCCCA CGCCATCCCC CATCTGACCA CCAGCGAAAT  
       TGCAGAGGGC GCGCAGGGT GCGGTAGGGC GTAGACTGGT GGTCGCTTTA

+2     D F C I E L G N K R W Q F N R Q  
-----  
3601   GGATTTTTGC ATCGAGCTGG GTAATAAGCG TTGGCAATTT AACCGCCAGT  
       CCTAAAAACG TAGCTCGACC CATTATTCGC AACCGTTAAA TTGGCGGTCA

+2     S G F L S Q M W I G D K K Q L L T  
-----  
3651   CAGGCTTTCT TTCACAGATG TGGATTGGCG ATAAAAACA ACTGCTGACG  
       GTCCGAAAGA AAGTGTCTAC ACCTAACCGC TATTTTTTGT TGACGACTGC

+2     P L R D Q F T R A P L D N D I G V  
-----  
3701   CCGCTGCGCG ATCAGTTCAC CCGTGCACCG CTGGATAACG ACATTGGCGT  
       GGCGACGCGC TAGTCAAGTG GGCACGTGGC GACCTATTGC TGTAACCGCA

+2     S E A T R I D P N A W V E R W K  
-----  
3751   AAGTGAAGCG ACCCGCATTG ACCCTAACGC CTGGGTCGAA CGCTGGAAGG  
       TTCACTTCGC TGGGCGTAAC TGGGATTGCG GACCCAGCTT GCGACCTTCC

+2     A A G H Y Q A E A A L L Q C T A D  
-----  
3801   CGGCGGGCCA TTACCAGGCC GAAGCAGCGT TGTTGCAGTG CACGGCAGAT  
       GCCGCCCGGT AATGGTCCGG CTTCGTCGCA ACAACGTCAC GTGCCGTCTA

FIG.10J



27/78

pICAST ALC

```

+2   T L A D A V L I T T A H A W Q H Q
-----
3851  A C A T T G C T G A T G C G G T G C T G A T T A C G A C C G C T C A C G C G T G G C A G C A T C A
      T G T G A A C G A C T A C G C C A C G A C T A A T G C T G G C G A G T G C G C A C C G T C G T A G T

+2   G K T L F I S R K T Y R I D G S
-----
3901  G G G G A A A A C C T T A T T T A T C A G C C G G A A A A C C T A C C G G A T T G A T G G T A G T G
      C C C C T T T T G G A A T A A A T A G T C G G C C T T T T G G A T G G C C T A A C T A C C A T C A C

+2   G Q M A I T V D V E V A S D T P H
-----
3951  G T C A A A T G G C G A T T A C C G T T G A T G T T G A A G T G G C G A G C G A T A C A C C G C A T
      C A G T T T A C C G C T A A T G G C A A C T A C A A C T T C A C C G C T C G C T A T G T G G C G T A

+2   P A R I G L N C Q L A Q V A E R V
-----
4001  C C G G C G C G G A T T G G C C T G A A C T G C C A G C T G G C G C A G G T A G C A G A G C G G G T
      G G C C G C G C C T A A C C G G A C T T G A C G G T C G A C C G C G T C C A T C G T C T G C C C A

+2   N W L G L G P Q E N Y P D R L T
-----
4051  A A A C T G G C T C G G A T T A G G G C C G C A A G A A A A C T A T C C C G A C C G C C T T A C T G
      T T T G A C C G A G C C T A A T C C C G G C G T T C T T T T G A T A G G G C T G G C G G A A T G A C

+2   A A C F D R W D L P L S D M Y T P
-----
4101  C C G C C T G T T T T G A C C G C T G G G A T C T G C C A T T G T C A G A C A T G T A T A C C C G
      G G C G G A C A A A A C T G G C G A C C C T A G A C G G T A A C A G T C T G T A C A T A T G G G G C

+2   T V F P S E N G L R C G T R E L N
-----
4151  T A C G T C T T C C C G A G C G A A A A C G G T C T G C G C T G C G G G A C G C G C G A A T T G A A
      A T G C A G A A G G G C T C G C T T T T G C C A G A C G C G A C G C C C T G C G C G C T T A A C T T

```

FIG.10K



28/78

pICAST ALC

```

+2      Y G P H Q W R G D F Q F N I S R
-----
4201    TTATGGCCCA CACCA GTGGC GCGGCGACTT CCAGTTCAAC ATCAGCCGCT
        AATACCGGGT GTGGTCACCG CGCCGCTGAA GGTCAAGTTG TAGTCGGCGA

+2      Y S Q Q Q L M E T S H R H L L H A
-----
4251    ACAGTCAACA GCAACTGATG GAAACCAGCC ATCGCCATCT GCTGCACGCG
        TGTCAGTTGT CGTTGACTAC CTTTGGTCGG TAGCGGTAGA CGACGTGCGC

+2      E E G T W L N I D G F H M G I G G
-----
4301    GAAGAAGGCA CATGGCTGAA TATCGACGGT TTCCATATGG GGATTGGTGG
        CTTCTTCCGT GTACCGACTT ATAGCTGGCA AAGGTATACC CCTAACCACC

+2      D D S W S P S V S A E F Q L S A
-----
4351    CGACGACTCC TGGAGCCCGT CAGTATCGGC GGAATTCCAG CTGAGCGCCG
        GCTGCTGAGG ACCTCGGGCA GTCATAGCCG CCTTAAGGTC GACTCGCGGC

+2      G R Y H Y Q L V W C Q K R S D Y K
-----
4401    GTCGCTACCA TTACCAGTTG GTCTGGTGTC AAAAAAGATC TGA CTATAAA
        CAGCGATGGT AATGGTCAAC CAGACCACAG TTTTTTCTAG ACTGATATTT

+2      D E D L D H H H H H H R
----->
4451    GATGAGGACC TCGACCATCA TCATCATCAT CACCGGTAAT AATAGGTAGA
        CTACTCCTGG AGCTGGTAGT AGTAGTAGTA GTGGCCATTA TTATCCATCT

4501    TAAGTGACTG ATTAGATGCA TTGATCCCTC GACCAATTCC GGTTATTTTC
        ATCACTGAC TAATCTACGT AACTAGGGAG CTGGTTAAGG CCAATAAAAG

4551    CACCATATTG CCGTCTTTTG GCAATGTGAG GGCCCGGAAA CCTGGCCCTG
        GTGGTATAAC GGCAGAAAAC CGTTACACTC CCGGGCCTTT GGACCGGGAC

```

FIG.10L



29/78

## pICAST ALC

4601 TCTTCTTGAC GAGCATTCCT AGGGGTCTTT CCCCTCTCGC CAAAGGAATG  
AGAAGAACTG CTCGTAAGGA TCCCAGAAA GGGGAGAGCG GTTTCCTTAC

4651 CAAGGTCTGT TGAATGTCGT GAAGGAAGCA GTTCCTCTGG AAGCTTCTTG  
GTTCCAGACA ACTTACAGCA CTTCTTCGT CAAGGAGACC TTCGAAGAAC

4701 AAGACAAACA ACGTCTGTAG CGACCCTTTG CAGGCAGCGG AACCCCCAC  
TTCTGTTTGT TGCAGACATC GCTGGGAAAC GTCCGTCGCC TTGGGGGGTG

4751 CTGGCGACAG GTGCCTCTGC GGCCAAAAGC CACGTGTATA AGATACACCT  
GACCGCTGTC CACGGAGACG CCGGTTTTCG GTGCACATAT TCTATGTGGA

4801 GCAAAGGCGG CACAACCCCA GTGCCACGTT GTGAGTTGGA TAGTTGTGGA  
CGTTTCCGCC GTGTTGGGGT CACGGTGCAA CACTCAACCT ATCAACACCT

4851 AAGAGTCAAA TGGCTCTCCT CAAGCGTATT CAACAAGGGG CTGAAGGATG  
TTCTCAGTTT ACCGAGAGGA GTTCGCATAA GTTGTTCCCC GACTTCCTAC

4901 CCCAGAAGGT ACCCCATTGT ATGGGATCTG ATCTGGGGCC TCGGTGCACA  
GGGTCTTCCA TGGGGTAACA TACCCTAGAC TAGACCCCGG AGCCACGTGT

4951 TGCTTTACAT GTGTTTAGTC GAGGTAAAA AACGTCTAGG CCCCCGAAC  
ACGAAATGTA CACAAATCAG CTCCAATTTT TTGCAGATCC GGGGGGCTTG

5001 CACGGGGACG TGGTTTTCTT TTGAAAAACA CGATGATAAT ACCATGATTG  
GTGCCCCTGC ACCAAAAGGA AACTTTTTGT GCTACTATTA TGGTACTAAC

5051 AACAAGATGG ATTGCACGCA GGTTCTCCGG CCGCTTGGGT GGAGAGGCTA  
TTGTTCTACC TAACGTGCGT CCAAGAGGCC GGCGAACCCA CCTCTCCGAT

5101 TTCGGCTATG ACTGGGCACA ACAGACAATC GGCTGCTCTG ATGCCGCCGT  
AAGCCGATAC TGACCCGTGT TGTCTGTTAG CCGACGAGAC TACGGCGGCA

5151 GTTCCGGCTG TCAGCGCAGG GCGCCCCGT TCTTTTGTG AAGACCGACC  
CAAGCCGAC AGTCGCGTCC CCGCGGGCCA AGAAAAACAG TTCTGGCTGG

FIG.10M



30/78

## pICAST ALC

5201 TGTCCGGTGC CCTGAATGAA CTGCAGGACG AGGCAGCGCG GCTATCGTGG  
ACAGGCCACG GGACTTACTT GACGTCCTGC TCCGTCGCGC CGATAGCACC

5251 CTGGCCACGA CGGGCGTTCC TTGCGCAGCT GTGCTCGACG TTGTCACTGA  
GACCGGTGCT GCCCGCAAGG AACGCGTCGA CACGAGCTGC AACAGTGACT

5301 AGCGGGAAGG GACTGGCTGC TATTGGGCGA AGTGCCGGGG CAGGATCTCC  
TCGCCCTTCC CTGACCGACG ATAACCCGCT TCACGGCCCC GTCCTAGAGG

5351 TGTCATCTCA CCTTGCTCCT GCCGAGAAAG TATCCATCAT GGCTGATGCA  
ACAGTAGAGT GGAACGAGGA CGGCTCTTTC ATAGGTAGTA CCGACTACGT

5401 ATGCGGCGGC TGCATACGCT TGATCCGGCT ACCTGCCCAT TCGACCACCA  
TACGCCGCCG ACGTATGCGA ACTAGGCCGA TGGACGGGTA AGCTGGTGGT

5451 AGCGAAACAT CGCATCGAGC GAGCACGTAC TCGGATGGAA GCCGGTCTTG  
TCGCTTTGTA GCGTAGCTCG CTCGTGCATG AGCCTACCTT CGGCCAGAAC

5501 TCGATCAGGA TGATCTGGAC GAAGAGCATC AGGGGCTCGC GCCAGCCGAA  
AGCTAGTCCT ACTAGACCTG CTTCTCGTAG TCCCCGAGCG CGGTCGGCTT

5551 CTGTTCGCCA GGCTCAAGGC GCGCATGCCC GACGGCGAGG ATCTCGTCGT  
GACAAGCGGT CCGAGTTCCG CGCGTACGGG CTGCCGCTCC TAGAGCAGCA

5601 GACCCATGGC GATGCCTGCT TGCCGAATAT CATGGTGGAA AATGGCCGCT  
CTGGGTACCG CTACGGACGA ACGGCTTATA GTACCACCTT TTACCGGCGA

5651 TTTCTGGATT CATCGACTGT GGCCGGCTGG GTGTGGCGGA CCGCTATCAG  
AAAGACCTAA GTAGCTGACA CCGGCCGACC CACACCGCCT GGCGATAGTC

5701 GACATAGCGT TGGCTACCCG TGATATTGCT GAAGAGCTTG GCGGCGAATG  
CTGTATCGCA ACCGATGGGC ACTATAACGA CTTCTCGAAC CGCCGCTTAC

5751 GGCTGACCGC TTCCTCGTGC TTTACGGTAT CGCCGCTCCC GATTGCGAGC  
CCGACTGGCG AAGGAGCACG AAATGCCATA GCGGCGAGGG CTAAGCGTCG

FIG.10N



31/78

pICAST ALC

5801 GCATCGCCTT CTATCGCCTT CTTGACGAGT TCTTCTGAGC GGGACTCTGG  
 CGTAGCGGAA GATAGCGGAA GAACTGCTCA AGAAGACTCG CCCTGAGACC  
 5851 GGTTCGCATC GATAAAATAA AAGATTTTAT TTAGTCTCCA GAAAAAGGGG  
 CCAAGCGTAG CTATTTTATT TTCTAAAATA AATCAGAGGT CTTTTTCCCC  
 5901 GGAATGAAAG ACCCCACCTG TAGGTTTGGC AAGCTAGCTT AAGTAACGCC  
 CCTTACTTTC TGGGGTGGAC ATCCAAACCG TTCGATCGAA TTCATTGCGG  
 5951 ATTTTGCAAG GCATGGAAAA ATACATAACT GAGAATAGAG AAGTTCAGAT  
 TAAACGTTT CGTACCTTTT TATGTATTGA CTCTTATCTC TTCAAGTCTA  
 6001 CAAGGTCAGG AACAGATGGA ACAGCTGAAT ATGGGCCAAA CAGGATATCT  
 GTTCCAGTCC TTGTCTACCT TGTCGACTTA TACCCGGTTT GTCCTATAGA  
 6051 GTGGTAAGCA GTTCCTGCCC CGGCTCAGGG CCAAGAACAG ATGGAACAGC  
 CACCATTCTG CAAGGACGGG GCCGAGTCCC GGTTCCTGTC TACCTTGTCG  
 6101 TGAATATGGG CCAAACAGGA TATCTGTGGT AAGCAGTTCC TGCCCCGGCT  
 ACTTATACCC GGTTCGTCTT ATAGACACCA TTCGTCAAGG ACGGGGCCGA  
 6151 CAGGGCCAAG AACAGATGGT CCCAGATGC GGTCCAGCCC TCAGCAGTTT  
 GTCCCGGTTT TTGTCTACCA GGGGTCTACG CCAGGTCGGG AGTCGTCAAA  
 6201 CTAGAGAACC ATCAGATGTT TCCAGGGTGC CCAAGGACC TGAAATGACC  
 GATCTCTTGG TAGTCTACAA AGGTCCACG GGGTTCCTGG ACTTTACTGG  
 6251 CTGTGCCTTA TTTGAACTAA CCAATCAGTT CGCTTCTCGC TTCTGTTTCG  
 GACACGGAAT AAACCTTGATT GGTTAGTCAA GCGAAGAGCG AAGACAAGCG  
 6301 GCGCTTCTGC TCCCCGAGCT CAATAAAAGA GCCCACAACC CCTCACTCGG  
 CGCGAAGACG AGGGGCTCGA GTTATTTTCT CGGGTGTTGG GGAGTGAGCC  
 6351 GGCGCCAGTC CTCCGATTGA CTGAGTCGCC CGGGTACCCG TGTATCCAAT  
 CCGCGGTCAG GAGGCTAACT GACTCAGCGG GCCCATGGGC ACATAGGTTA

FIG.100



32/78

pICAST ALC

6401 AAACCCTCTT GCAGTTGCAT CCGACTTGTG GTCTCGCTGT TCCTTGGGAG  
TTTGGGAGAA CGTCAACGTA GGCTGAACAC CAGAGCGACA AGGAACCCTC

6451 GGTCTCCTCT GAGTGATTGA CTACCCGTCA GCGGGGGTCT TTCATTATG  
CCAGAGGAGA CTCACTAACT GATGGGCAGT CGCCCCCAGA AAGTAAGTAC

6501 CAGCATGTAT CAAAATTAAT TTGGTTTTTT TTCTTAAGTA TTTACATTAA  
GTCGTACATA GTTTTAATTA AACCAAAAAA AAGAATTCAT AAATGTAATT

6551 ATGGCCATAG TTGCATTAAT GAATCGGCCA ACGCGCGGGG AGAGGCGGTT  
TACCGGTATC AACGTAATTA CTTAGCCGGT TGC GCGCCCC TCTCCGCCAA

6601 TCGTATTGG CGCTCTTCCG CTTCTCGCT CACTGACTCG CTGCGCTCGG  
ACGCATAACC GCGAGAAGGC GAAGGAGCGA GTGACTGAGC GACGCGAGCC

6651 TCGTTCGGCT GCGGCGAGCG GTATCAGCTC ACTCAAAGGC GGTAATACGG  
AGCAAGCCGA CGCCGCTCGC CATAGTCGAG TGAGTTTCCG CCATTATGCC

FIG.1OP



33/78

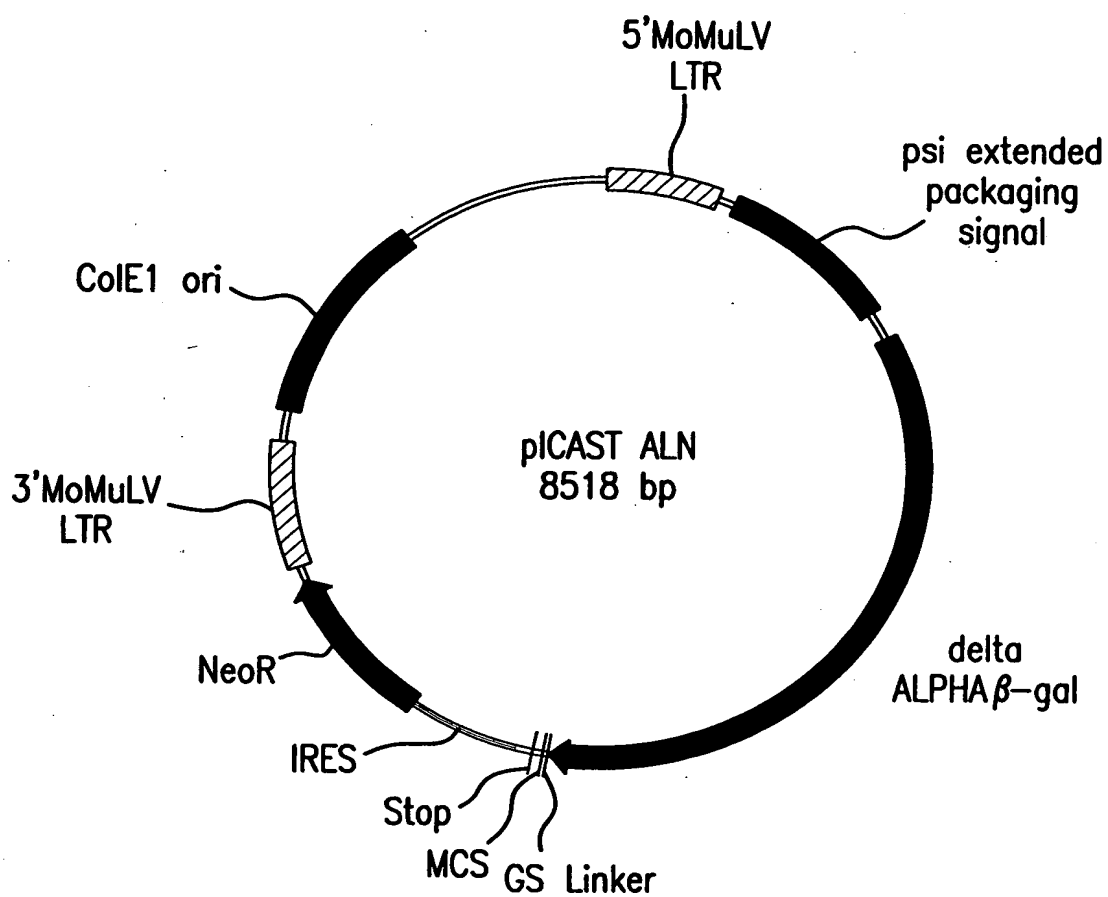
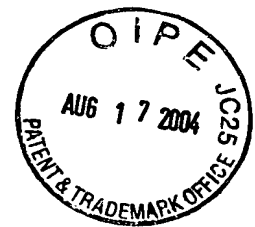


FIG.11A





34/78

## pICAST ALN

CTGCAGCCTG AATATGGGCC AAACAGGATA TCTGTGGTAA GCAGTTCCTG CCCC GGCTCA	60
GACGTCGGAC TTATACCCGG TTTGTCCTAT AGACACCATT CGTCAAGGAC GGGGCCGAGT	60
GGGCCAAGAA CAGATGGAAC AGCTGAATAT GGGCCAAACA GGATATCTGT GGTAAGCAGT	120
CCCGGTTCTT GTCTACCTTG TCGACTTATA CCCGGTTTGT CCTATAGACA CCATTTCGTCA	120
TCCTGCCCCG GCTCAGGGCC AAGAACAGAT GGTCCCCAGA TGCGGTCCAG CCCTCAGCAG	180
AGGACGGGGC CGAGTCCCGG TTCTTGCTCTA CCAGGGGTCT ACGCCAGGTC GGGAGTCGTC	180
TTTCTAGAGA ACCATCAGAT GTTCCAGGG TGCCCCAAGG ACCTGAAATG ACCCTGTGCC	240
AAAGATCTCT TGGTAGTCTA CAAAGGTCCC ACGGGGTTCC TGGACTTTAC TGGGACACGG	240
TTATTTGAAC TAACCAATCA GTTCGCTTCT CGCTTCTGTT CGCGCGCTTC TGCTCCCCGA	300
AATAAACTTG ATTGGTTAGT CAAGCGAAGA GCGAAGACAA GCGCGCGAAG ACGAGGGGCT	300
GCTCAATAAA AGAGCCCACA ACCCGTCACT CGGGGCGCCA GTCCTCCGAT TGA CTGAGTC	360
CGAGTTATTT TCTCGGGTGT TGGGGAGTGA GCCCGCGGCT CAGGAGGCTA ACTGACTCAG	360
GCCCGGGTAC CCGTGTATCC AATAAACCTT CTTGCAGTTG CATCCGACTT GTGGTCTCGC	420
CGGGCCCATG GGCACATAGG TTATTTGGGA GAACGTCAAC GTAGGCTGAA CACCAGAGCG	420
TGTTCCCTTG GAGGGTCTCC TCTGAGTGAT TGA CTACCCG TCAGCGGGGG TCTTTTCA TTT	480
ACAAGGAACC CTCCCAGAGG AGACTCACTA ACTGATGGGC AGTCGCCCCC AGAAAGTAAA	480
GGGGGCTCGT CCGGGATCGG GAGACCCCTG CCCAGGGACC ACCGACCCAC CACCGGGAGG	540
CCCCGAGCA GGCCCTAGCC CTCTGGGGAC GGGTCCCTGG TGGCTGGGTG GTGGCCCTCC	540
CAAGCTGGCC AGCAACTTAT CTGTGTCTGT CCGATTGTCT AGTGTCTATG ACTGATTTTA	600
GTTCGACCGG TCGTTGAATA GACACAGACA GGCTAACAGA TCACAGATAC TGA CTAAAAT	600
TGCGCCTGCG TCGGTACTAG TTAGCTAACT AGCTCTGTAT CTGGCGGACC CGTGGTGGAA	660
ACGCGGACGC AGCCATGATC AATCGATTGA TCGAGACATA GACCGCCTGG GCACCACCTT	660
CTGACGAGTT CTGAACACCC GGCCGCAACC CTGGGAGACG TCCAGGGAC TTTGGGGGCC	720
GACTGCTCAA GACTTGTGGG CCGGCGTTGG GACCCTCTGC AGGGTCCCTG AAACCCCGG	720
GTTTTTGTGG CCCGACCTGA GGAAGGGAGT CGATGTGGAA TCCGACCCCG TCAGGATATG	780
CAAAAACACC GGGCTGGACT CCTCCCTCA GCTACACCTT AGGCTGGGGC AGTCCTATAC	780

FIG.11B



35/78

## pICAST ALN

TGGTTCTGGT	AGGAGACGAG	AACCTAAAAC	AGTTCCCGCC	TCCGTCTGAA	TTTTTGCTTT	840
ACCAAGACCA	TCCTCTGCTC	TTGGATTTTG	TCAAGGGCGG	AGGCAGACTT	AAAAACGAAA	840
CGGTTTGGA	CCGAAGCCGC	GCGTCTTGTC	TGCTGCAGCA	TCGTTCTGTG	TTGTCTCTGT	900
GCCAAACCTT	GGCTTCGGCG	CGCAGAACAG	ACGACGTCGT	AGCAAGACAC	AACAGAGACA	900
CTGACTGTGT	TTCTGTATTT	GTCTGAAAAT	TAGGGCCAGA	CTGTTACCAC	TCCCTTAAGT	960
GA CTGACACA	AAGACATAAA	CAGACTTTTA	ATCCCGGTCT	GACAATGGTG	AGGGAATTCA	960
TTGACCTTAG	GTA ACTGGAA	AGATGTCGAG	CGGCTCGCTC	ACAACCAGTC	GGTAGATGTC	1020
AACTGGAATC	CATTGACCTT	TCTACAGCTC	GCCGAGCGAG	TGTTGGTCAG	CCATCTACAG	1020
AAGAAGAGAC	GTTGGGTTAC	CTTCTGCTCT	GCAGAATGGC	CAACCTTTAA	CGTCGGATGG	1080
TTCTTCTCTG	CAACCCAATG	GAAGACGAGA	CGTCTTACCG	GTTGGAAATT	GCAGCCTACC	1080
CCGCGAGACG	GCACCTTTAA	CCGAGACCTC	ATCACCCAGG	TTAAGATCAA	GGTCTTTTCA	1140
GGCGCTCTGC	CGTGGAAATT	GGCTCTGGAG	TAGTGGGTCC	AATTCTAGTT	CCAGAAAAGT	1140
CCTGGCCCGC	ATGGACACCC	AGACCAGGTC	CCCTACATCG	TGACCTGGGA	AGCCTTGGCT	1200
GGACCGGGCG	TACCTGTGGG	TCTGGTCCAG	GGGATGTAGC	ACTGGACCCT	TCGGAACCGA	1200
TTTGACCCCC	CTCCCTGGGT	CAAGCCCTTT	GTACACCCTA	AGCCTCCGCC	TCCTCTTCCT	1260
AAACTGGGGG	GAGGGACCCA	GTTCCGGAAA	CATGTGGGAT	TCGGAGGCGG	AGGAGAAGGA	1260
CCATCCGCCC	CGTCTCTCCC	CCTTGAACCT	CCTCGTTCGA	CCCCGCCTCG	ATCCTCCCTT	1320
GGTAGGCGGG	GCAGAGAGGG	GGA ACTTGGA	GGAGCAAGCT	GGGGCGGAGC	TAGGAGGGAA	1320
TATCCAGCCC	TCACTCCTTC	TCTAGGCGCC	GGCCGCTCTA	GCCCATTAAT	ACGACTCACT	1380
ATAGGTCGGG	AGTGAGGAAG	AGATCCGCGG	CCGGCGAGAT	CGGGTAATTA	TGCTGAGTGA	1380
ATAGGGCGAT	TCGAACACCA	TGCACCATCA	TCATCATCAC	GTCGACTATA	AAGATGAGGA	1440
TATCCCGCTA	AGCTTGTTGGT	ACGTGGTAGT	AGTAGTAGTG	CAGCTGATAT	TTCTACTCCT	1440
CCTCGAGATG	GGCGTGATTA	CGGATTCACT	GGCCGTCGTG	GCCCGCACCG	ATCGCCCTTC	1500
GGAGCTCTAC	CCGCACTAAT	GCCTAAGTGA	CCGGCAGCAC	CGGGCGTGGC	TAGCGGGAAG	1500
CCAACAGTTA	CGCAGCCTGA	ATGGCGAATG	GCGCTTTGCC	TGGTTTCCGG	CACCAGAAGC	1560
GGTTGTCAAT	GCGTCGGACT	TACCGCTTAC	CGCGAAACGG	ACCAAAGGCC	GTGGTCTTCG	1560

FIG. 11C



36/78

## pICAST ALN

GGTGCCGGAA	AGCTGGCTGG	AGTGCGATCT	TCCTGAGGCC	GATACTGTCTG	TCGTCCCCTC	1620
CCACGGCCTT	TCGACCGACC	TCACGCTAGA	AGGACTCCGG	CTATGACAGC	AGCAGGGGAG	1620
AAACTGGCAG	ATGCACGGTT	ACGATGCGCC	CATCTACACC	AACGTGACCT	ATCCCATTAC	1680
TTTGACCGTC	TACGTGCCAA	TGCTACGCGG	GTAGATGTGG	TTGCACTGGA	TAGGGTAATG	1680
GGTCAATCCG	CCGTTTGTTT	CCACGGAGAA	TCCGACGGGT	TGTTACTCGC	TCACATTTAA	1740
CCAGTTAGGC	GGCAAACAAG	GGTGCTCTT	AGGCTGCCCA	ACAATGAGCG	AGTGTAATTT	1740
TGTTGATGAA	AGCTGGCTAC	AGGAAGGCCA	GACGCGAATT	ATTTTTGATG	GCGTTAACTC	1800
ACAACTACTT	TCGACCGATG	TCCTTCCGGT	CTGCGCTTAA	TAAAAACTAC	CGCAATTGAG	1800
GGCGTTTCAT	CTGTGGTGCA	ACGGGCGCTG	GGTCGGTTAC	GGCCAGGACA	GTCGTTTGCC	1860
CCGCAAAGTA	GACACCACGT	TGCCCGCGAC	CCAGCCAATG	CCGGTCCTGT	CAGCAAACGG	1860
GTCTGAATTT	GACCTGAGCG	CATTTTTACG	CGCCGGAGAA	AACCGCCTCG	CGGTGATGGT	1920
CAGACTTAAA	CTGGACTCGC	GTAAAAATGC	GCGGCCTCTT	TTGGCGGAGC	GCCACTACCA	1920
GCTGGGCTGG	AGTGACGGCA	GTTATCTGGA	AGATCAGGAT	ATGTGGCGGA	TGAGCGGCAT	1980
CGACGCGACC	TACTGCCGT	CAATAGACCT	TCTAGTCTTA	TACACCGCCT	ACTCGCCGTA	1980
TTTCCGTGAC	GTCTCGTTGC	TGCATAAACC	GACTACACAA	ATCAGCGATT	TCCATGTTGC	2040
AAAGGCACTG	CAGAGCAACG	ACGTATTTGG	CTGATGTGTT	TAGTCGCTAA	AGGTACAACG	2040
CACTCGCTTT	AATGATGATT	RCAGCCGCGC	TGTA CTGGAG	GCTGAAGTTC	AGATGTGCGG	2100
GTGAGCGAAA	TACTACTAA	AGTCGGCGCG	ACATGACCTC	CGACTTCAAG	TCTACACGCC	2100
CGAGTTGCGT	GACTACCTAC	GGGTAACAGT	TTCTTTATGG	CAGGGTGAAA	CGCAGGTCGC	2160
GCTCAACGCA	CTGATGGATG	CCCATTGTCA	AAGAAATACC	GTCCCACTTT	GCGTCCAGCG	2160
CAGCGGCACC	GCGCCTTTTC	GCGGTGAAAT	TATCGATGAG	CGTGGTGGTT	ATGCCGATCG	2220
GTCGCCGTGG	CGCGGAAAGC	CGCCACTTTA	ATAGCTACTC	GCACCACCAA	TACGGCTAGC	2220
CGTCACACTA	CGTCTGAACG	TCGAAAACCC	GAACTGTGG	AGCGCCGAAA	TCCCGAATCT	2280
GCAGTGTGAT	GCAGACTTGC	AGCTTTTGGG	CTTTGACACC	TCGCGGCTTT	AGGGCTTAGA	2280
CTATCGTGCG	GTGGTTGAAC	TGCACACCGC	CGACGGCACG	CTGATTGAAG	CAGAAGCCTG	2340
GATAGCACGC	CACCAACTTG	ACGTGTGGCG	GCTGCCGTGC	GACTAACTTC	GTCTTCGGAC	2340

FIG.11D

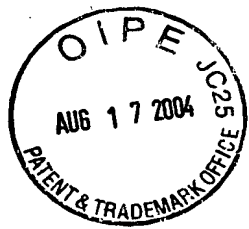


37/78

## pICAST ALN

CGATGTCGGT	TTCCGCGAGG	TGCGGATTGA	AAATGGTCTG	CTGCTGCTGA	ACGGCAAGCC	2400
GCTACAGCCA	AAGGCGCTCC	ACGCCTAACT	TTTACCAGAC	GACGACGACT	TGCCGTTCCG	2400
GTTGCTGATT	CGAGGCGTTA	ACCGTCACGA	GCATCATCCT	CTGCATGGTC	AGGTCATGGA	2460
CAACGACTAA	GCTCCGCAAT	TGGCAGTGCT	CGTAGTAGGA	GACGTACCAG	TCCAGTACCT	2460
TGAGCAGACG	ATGGTGCAGG	ATATCCTGCT	GATGAAGCAG	AACAACCTTA	ACGCCGTGCG	2520
ACTCGTCTGC	TACCACGTCC	TATAGGACGA	CTACTTCGTC	TTGTTGAAAT	TGCGGCACGC	2520
CTGTTTCGCAT	TATCCGAACC	ATCCGCTGTG	GTACACGCTG	TGCGACCGCT	ACGGCCTGTA	2580
GACAAGCGTA	ATAGGCTTGG	TAGGCGACAC	CATGTGCGAC	ACGCTGGCGA	TGCCGGACAT	2580
TGTGGTGGAT	GAAGCCAATA	TTGAAACCCA	CGGCATGGTG	CCAATGAATC	GTCTGACCGA	2640
ACACCACCTA	CTTCGGTTAT	AACTTTGGGT	GCCGTACCAC	GGTTACTTAG	CAGACTGGCT	2640
TGATCCGCGC	TGGCTACCGG	CGATGAGCGA	ACGCGTAACG	CGAATGGTGC	AGCGCGATCG	2700
ACTAGGCGCG	ACCGATGGCC	GCTACTCGCT	TGCGCATTGC	GCTTACCACG	TCGCGCTAGC	2700
TAATCACCCG	AGTGTGATCA	TCTGGTCGCT	GGGGAATGAA	TCAGGCCACG	GCGCTAATCA	2760
ATTAGTGGGC	TCACACTAGT	AGACCAGCGA	CCCCTTACTT	AGTCCGGTGC	CGCGATTAGT	2760
CGACGCGCTG	TATCGCTGGA	TCAAATCTGT	CGATCCTTCC	CGCCCGGTGC	AGTATGAAGG	2820
GCTGCGCGAC	ATAGCGACCT	AGTTTAGACA	GCTAGGAAGG	GCGGGCCACG	TCATACTTCC	2820
CGGCGGAGCC	GACACCACGG	CCACCGATAT	TATTTGCCCC	ATGTACGCGC	GCGTGGATGA	2880
GCCGCCTCGG	CTGTGGTGCC	GGTGGCTATA	ATAAACGGGC	TACATGCGCG	CGCACCTACT	2880
AGACCAGCCC	TTCCCGGCTG	TGCCGAAATG	GTCCATCAAA	AAATGGCTTT	CGCTACCTGG	2940
TCTGGTCGGG	AAGGGCCGAC	ACGGCTTTAC	CAGGTAGTTT	TTTACCGAAA	GCGATGGACC	2940
AGAGACGCGC	CCGCTGATCC	TTTGCGAATA	CGCCACGCG	ATGGGTAACA	GTCTTGGCGG	3000
TCTCTGCGCG	GGCGACTAGG	AAACGCTTAT	GCGGGTGCGC	TACCCATTGT	CAGAACCGCC	3000
TTTCGCTAAA	TACTGGCAGG	CGTTTCGTCA	GTATCCCCGT	TTACAGGGCG	GCTTCGTCTG	3060
AAAGCGATTT	ATGACCGTCC	GCAAAGCAGT	CATAGGGGCA	AATGTCCCGC	CGAAGCAGAC	3060
GGACTGGGTG	GATCAGTCGC	TGATTAAATA	TGATGAAAAC	GGCAACCCGT	GGTCGGCTTA	3120
CCTGACCCAC	CTAGTCAGCG	ACTAATTTAT	ACTACTTTTG	CCGTTGGGCA	CCAGCCGAAT	3120

FIG. 11E



38/78

## pICAST ALN

CGGCGGTGAT	TTTGCGGATA	CGCCGAACGA	TCGCCAGTTC	TGTATGAACG	GTCTGGTCTT	3180
GCCGCCACTA	AAACCGCTAT	GCGGCTTGCT	AGCGGTCAAG	ACATACTTGC	CAGACCAGAA	3180
TGCCGACCGC	ACGCCGCATC	CAGCGCTGAC	GGAAGCAAAA	CACCAGCAGC	AGTTTTTCCA	3240
ACGGCTGGCG	TGCGGCGTAG	GTCGCGACTG	CCTTCGTTTT	GTGGTCGTCG	TCAAAAAGGT	3240
GTTCCGTTTA	TCCGGGCAAA	CCATCGAAGT	GACCAGCGAA	TACCTGTTCC	GTCATAGCGA	3300
CAAGGCAAAT	AGGCCCGTTT	GGTAGCTTCA	CTGGTCGCTT	ATGGACAAGG	CAGTATCGCT	3300
TAACGAGCTC	CTGCACTGGA	TGGTGGCGCT	GGATGGTAAG	CCGCTGGCAA	GCGGTGAAGT	3360
ATTGCTCGAG	GACGTGACCT	ACCACCGCGA	CCTACCATTG	GGCGACCGTT	CGCCACTTCA	3360
GCCTCTGGAT	GTCGCTCCAC	AAGGTAAACA	GTTGATTGAA	CTGCCTGAAC	TACCGCAGCC	3420
CGGAGACCTA	CAGCGAGGTG	TTCCATTTGT	CAACTAACTT	GACGGACTTG	ATGGCGTCGG	3420
GGAGAGCGCC	GGGCAACTCT	GGCTCACAGT	ACGCGTAGTG	CAACCGAACG	CGACCGCATG	3480
CCTCTCGCGG	CCCGTTGAGA	CCGAGTGTCA	TGCGCATCAC	GTTGGCTTGC	GCTGGCGTAC	3480
GTCAGAAAGC	GGGCACATCA	GCGCCTGGCA	GCAGTGGCGT	CTGGCGGAAA	ACCTCAGTGT	3540
CAGTCTTCGG	CCCGTGTAGT	CGCGGACCGT	CGTCACCGCA	GACCGCCTTT	TGGAGTCACA	3540
GACGCTCCCC	GCCGCGTCCC	ACGCCATCCC	GCATCTGACC	ACCAGCGAAA	TGGATTTTTG	3600
CTGCGAGGGG	CGGCGCAGGG	TGCGGTAGGG	CGTAGACTGG	TGGTCGCTTT	ACCTAAAAAC	3600
CATCGAGCTG	GGTAATAAGC	GTTGGCAATT	TAACCGCCAG	TCAGGCTTTC	TTTCACAGAT	3660
GTAGCTCGAC	CCATTATTCG	CAACCGTTAA	ATTGGCGGTC	AGTCCGAAAG	AAAGTGTCTA	3660
GTGGATTGGC	GATAAAAAAC	AACTGCTGAC	GCCGCTGCGC	GATCAGTTCA	CCCGTGCACC	3720
CACCTAACCG	CTATTTTTTG	TTGACGACTG	CGGCGACGCG	CTAGTCAAGT	GGGCACGTGG	3720
GCTGGATAAC	GACATTGGCG	TAAGTGAAGC	GACCCGCATT	GACCCTAACG	CCTGGGTCGA	3780
CGACCTATTG	CTGTAACCGC	ATTCACTTCG	CTGGGCGTAA	CTGGGATTGC	GGACCCAGCT	3780
ACGCTGGAAG	GCGGCGGGCC	ATTACCAGGC	CGAAGCAGCG	TTGTTGCAGT	GCACGGCAGA	3840
TGCGACCTTC	CGCCGCCCGG	TAATGGTCCG	GCTTCGTCGC	AACAACGTCA	CGTGCCGTCT	3840
TACACTTGCT	GATGCGGTGC	TGATTACGAC	CGCTCACGCG	TGGCAGCATC	AGGGGAAAAC	3900
ATGTGAACGA	CTACGCCACG	ACTAATGCTG	GCGAGTGCGC	ACCGTCGTAG	TCCCCTTTTG	3900

FIG.11F



39/78

## pICAST ALN

CTTATTTATC	AGCCGGAAAA	CCTACCGGAT	TGATGGTAGT	GGTCAAATGG	CGATTACCGT	3960		
GAATAAATAG	TCGGCCTTTT	GGATGGCCTA	ACTACCATCA	CCAGTTTACC	GCTAATGGCA	3960		
TGATGTTGAA	GTGGCGAGCG	ATACACCGCA	TCCGGCGCGG	ATTGGCCTGA	ACTGCCAGCT	4020		
ACTACAACCT	CACCGCTCGC	TATGTGGCGT	AGGCCGCGCC	TAACCGGACT	TGACGGTCGA	4020		
GGCGCAGGTA	GCAGAGCGGG	TAAACTGGCT	CGGATTAGGG	CCGCAAGAAA	ACTATCCCGA	4080		
CCGCGTCCAT	CGTCTCGCCC	ATTTGACCGA	GCCTAATCCC	GGCGTTCTTT	TGATAGGGCT	4080		
CCGCCTTACT	GCCGCCTGTT	TTGACCGCTG	GGATCTGCCA	TTGTCAGACA	TGTATACCCC	4140		
GGCGGAATGA	CGGCGGACAA	AACTGGCGAC	CCTAGACGGT	AACAGTCTGT	ACATATGGGG	4140		
GTACGTCTTC	CCGAGCGAAA	ACGGTCTGCG	CTGCGGGACG	CGCGAATTGA	ATTATGGCCC	4200		
CATGCAGAAG	GGCTCGCTTT	TGCCAGACGC	GACGCCCTGC	GCGCTTAACT	TAATACCGGG	4200		
ACACCAGTGG	CGCGGCGACT	TCCAGTTCAA	CATCAGCCGC	TACAGTCAAC	AGCAACTGAT	4260		
TGTGGTCACC	GCGCCGCTGA	AGGTCAAGTT	GTAGTCGGCG	ATGTCAGTTG	TCGTTGACTA	4260		
GGAAACCAGC	CATCGCCATC	TGCTGCACGC	GGAAGAAGGC	ACATGGCTGA	ATATCGACGG	4320		
CCTTTGGTCG	GTAGCGGTAG	ACGACGTGCG	CCTTCTTCCG	TGTACCGACT	TATAGCTGCC	4320		
TTTCCATATG	GGGATTGGTG	GCGACGACTC	CTGGAGCCCG	TCAGTATCGG	CGGAATTCCA	4380		
AAAGGTATAC	CCCTAACCAC	CGCTGCTGAG	GACCTCGGGC	AGTCATAGCC	GCCTTAAGGT	4380		
GCTGAGCGCC	GGTCGCTACC	ATTACCAGTT	GGTCTGGTGT	CAAAAAAGAT	CTGGAGGTGG	4440		
CGACTCGCGG	CCAGCGATGG	TAATGGTCAA	CCAGACCACA	GTTTTTTCTA	GACCTCCACC	4440		
TGGCAGCAGG	CCTTGCGCGG	CCGGATCCTT	AATTAACAAT	TGACCGGTAA	TAATAGGTAG	4500		
ACCGTCGTCC	GGAACCGCGC	GGCCTAGGAA	TTAATTGTTA	ACTGGCCATT	ATTATCCATC	4500		
ATAAGTGA	GATTAGATGC	ATTGATCCCT	CGACCAATTC	CGGTTATTTT	CCACCATATT	4560		
TATTA	CTACTGA	CTAATCTACG	TA	ACTAGGGA	GCTGGTTAAG	GCCAATAAAA	GGTGGTATAA	4560
GCCGTCTTTT	GGCAATGTGA	GGGCCCCGAA	ACCTGGCCCT	GTCTTCTTGA	CGAGCATTCC	4620		
CGGCAGAAAA	CCGTTACACT	CCCGGGCCTT	TGGACCGGGA	CAGAAGAACT	GCTCGTAAGG	4620		
TAGGGGTCTT	TCCCCTCTCG	CCAAAGGAAT	GCAAGGTCTG	TTGAATGTCG	TGAAGGAAGC	4680		
ATCCCCAGAA	AGGGGAGAGC	GGTTTCCTTA	CGTTCCAGAC	AACTTACAGC	ACTTCCTTCG	4680		

FIG. 11G



40/78

pICAST ALN

AGTTCCTCTG	GAAGCTTCTT	GAAGACAAAC	AACGTCTGTA	GCGACCCTTT	GCAGGCAGCG	4740
TCAAGGAGAC	CTTCGAAGAA	CTTCTGTTTG	TTGCAGACAT	CGCTGGGAAA	CGTCCGTGCG	4740
GAACCCCCCA	CCTGGCGACA	GGTGCCTCTG	CGGCCAAAAG	CCACGTGTAT	AAGATACACC	4800
CTTGGGGGGT	GGACCGCTGT	CCACGGAGAC	GCCGGTTTTT	GGTGCACATA	TTCTATGTGG	4800
TGCAAAGGCG	GCACAACCCC	AGTGCCACGT	TGTGAGTTGG	ATAGTTGTGG	AAAGAGTCAA	4860
ACGTTTCCGC	CGTGTTGGGG	TCACGGTGCA	AACTCAACC	TATCAACACC	TTTCTCAGTT	4860
ATGGCTCTCC	TCAAGCGTAT	TCAACAAGGG	GCTGAAGGAT	GCCCAGAAGG	TACCCCATTTG	4920
TACCGAGAGG	AGTTGCGATA	AGTTGTTCCC	CGACTTCCTA	CGGGTCTTCC	ATGGGGTAAC	4920
TATGGGATCT	GATCTGGGGC	CTCGGTGCAC	ATGCTTTACA	TGTGTTTAGT	CGAGGTTAAA	4980
ATACCCTAGA	CTAGACCCCG	GAGCCACGTG	TACGAAATGT	ACACAAATCA	GCTCCAATTT	4980
AAACGTCTAG	GCCCCCGAA	CCACGGGGAC	GTGGTTTTCC	TTTGAAAAAC	ACGATGATAA	5040
TTTGACAGATC	CGGGGGGCTT	GGTGCCCTG	CACCAAAAGG	AAACTTTTTG	TGCTACTATT	5040
TACCATGATT	GAACAAGATG	GATTGCACGC	AGGTTCTCCG	GCCGCTTGGG	TGGAGAGGCT	5100
ATGGTACTAA	CTTGTTCTAC	CTAACGTGCG	TCCAAGAGGC	CGGCGAACCC	ACCTCTCCGA	5100
ATTCGGCTAT	GAAGGGCAC	AACAGACAAT	CGGCTGCTCT	GATGCCGCCG	TGTTCCGGCT	5160
TAAGCCGATA	CTGACCCGTG	TTGTCTGTTA	GCCGACGAGA	CTACGGCGGC	ACAAGGCCGA	5160
GTCAGCGCAG	GGGCGCCCGG	TTCTTTTTGT	CAAGACCGAC	CTGTCCGGTG	CCCTGAATGA	5220
CAGTCGCGTC	CCGCGGGGCC	AAGAAAAACA	GTTCTGGCTG	GACAGGCCAC	GGGACTTACT	5220
ACTGCAGGAC	GAGGCAGCGC	GGCTATCGTG	GCTGGCCACG	ACGGGCGTTC	CTTGCGCAGC	5280
TGACGTCCCTG	CTCCGTGCGG	CCGATAGCAC	CGACCGGTGC	TGCCCCGAAG	GAACGCGTCG	5280
TGTGCTCGAC	GTTGTCACTG	AAGCGGGAAG	GGACTGGCTG	CTATTGGGCG	AAGTGCCGGG	5340
ACACGAGCTG	CAACAGTGAC	TTCGCCCTTC	CCTGACCGAC	GATAACCCGC	TTCACGGCCC	5340
GCAGGATCTC	CTGTCATCTC	ACCTTGCTCC	TGCCGAGAAA	GTATCCATCA	TGGCTGATGC	5400
CGTCCTAGAG	GACAGTAGAG	TGGAACGAGG	ACGGCTCTTT	CATAGGTAGT	ACCGACTACG	5400
AATGCGGCGG	CTGCATACGC	TTGATCCGGC	TACCTGCCCA	TTCGACCACC	AAGCGAAACA	5460
TTACGCCGCC	GACGTATGCG	AACTAGGCCG	ATGGACGGGT	AAGCTGGTGG	TTGCTTTGT	5460

FIG. 11H





41/78

## pICAST ALN

TCGCATCGAG	CGAGCACGTA	CTCGGATGGA	AGCCGGTCTT	GTCGATCAGG	ATGATCTGGA	5520
AGCGTAGCTC	GCTCGTGCAT	GAGCCTACCT	TCGGCCAGAA	CAGCTAGTCC	TACTAGACCT	5520
CGAAGAGCAT	CAGGGGCTCG	CGCCAGCCGA	ACTGTTGCGC	AGGCTCAAGG	CGCGCATGCC	5580
GCTTCTCGTA	GTCCCCGAGC	GCGGTCGGCT	TGACAAGCGG	TCCGAGTTCC	GCGCGTACGG	5580
CGACGGCGAG	GATCTCGTCG	TGACCCATGG	CGATGCCTGC	TTGCCGAATA	TCATGGTGGA	5640
GCTGCCGCTC	CTAGAGCAGC	ACTGGGTACC	GCTACGGACG	AACGGCTTAT	AGTACCACCT	5640
AAATGGCCGC	TTTTCTGGAT	TCATCGACTG	TGGCCGGCTG	GGTGTGGCGG	ACCGCTATCA	5700
TTTACCGGCG	AAAAGACCTA	AGTAGCTGAC	ACCGGCCGAC	CCACACCGCC	TGGCGATAGT	5700
GGACATAGCG	TTGGCTACCC	GTGATATTGC	TGAAGAGCTT	GGCGGCGAAT	GGGCTGACCG	5760
CCTGTATCGC	AACCGATGGG	CACTATAACG	ACTTCTCGAA	CCGCCGCTTA	CCCGACTGGC	5760
CTTCCTCGTG	CTTTACGGTA	TCGCCGCTCC	CGATTCGCAG	CGCATCGCCT	TCTATCGCCT	5820
GAAGGAGCAC	GAAATGCCAT	AGCGGCGAGG	GCTAAGCGTC	GCGTAGCGGA	AGATAGCGGA	5820
TCTTGACGAG	TTCTTCTGAG	CGGGACTCTG	GGGTTCGCAT	CGATAAAATA	AAAGATTTTA	5880
AGAACTGCTC	AAGAAGACTC	GCCCTGAGAC	CCCAAGCGTA	GCTATTTTAT	TTTCTAAAAT	5880
TTTAGTCTCC	AGAAAAAGGG	GGGAATGAAA	GACCCACCT	GTAGGTTTGG	CAAGCTAGCT	5940
AAATCAGAGG	TCTTTTTCCC	CCCTTACTTT	CTGGGGTGGA	CATCCAAACC	GTTTCGATCGA	5940
TAAGTAACGC	CATTTTGCAA	GGCATGGAAA	AATACATAAC	TGAGAATAGA	GAAGTTCAGA	6000
ATTCATTGCG	GTAAAACGTT	CCGTACCTTT	TTATGTATTG	ACTCTTATCT	CTTCAAGTCT	6000
TCAAGGTCAG	GAACAGATGG	AACAGCTGAA	TATGGGCCAA	ACAGGATATC	TGTGGTAAGC	6060
AGTTCCAGTC	CTTGTCTACC	TTGTGCACTT	ATACCCGGTT	TGTCCTATAG	ACACCATTCT	6060
AGTTCCTGCC	CCGGCTCAGG	GCCAAGAACA	GATGGAACAG	CTGAATATGG	GCCAAACAGG	6120
TCAAGGACGG	GGCCGAGTCC	CGGTTCTTGT	CTACCTTGTC	GACTTATACC	CGGTTTGTCC	6120
ATATCTGTGG	TAAGCAGTTC	CTGCCCCGGC	TCAGGGCCAA	GAACAGATGG	TCCCCAGATG	6180
TATAGACACC	ATTCGTCAAG	GACGGGGCCG	AGTCCCGGTT	CTTGTCTACC	AGGGGTCTAC	6180
CGGTCCAGCC	CTCAGCAGTT	TCTAGAGAAC	CATCAGATGT	TTCCAGGGTG	CCCCAAGGAC	6240
GCCAGGTCGG	GAGTCGTCAA	AGATCTCTTG	GTAGTCTACA	AAGGTCCAC	GGGGTTCCTG	6240

FIG. 111



42/78

pICAST ALN

CTGAAATGAC	CCTGTGCCTT	ATTTGAACTA	ACCAATCAGT	TCGCTTCTCG	CTTCTGTTCTG	6300
GACTTTACTG	GGACACGGAA	TAAACTTGAT	TGGTTAGTCA	AGCGAAGAGC	GAAGACAAGC	6300
CGCGCTTCTG	CTCCCCGAGC	TCAATAAAAG	AGCCCACAAC	CCCTCACTCG	GGGCGCCAGT	6360
GCGCGAAGAC	GAGGGGCTCG	AGTTATTTTC	TCGGGTGTTG	GGGAGTGAGC	CCCGCGGTCA	6360
CCTCCGATTG	ACTGAGTCGC	CCGGGTACCC	GTGTATCCAA	TAAACCCTCT	TGCAGTTGCA	6420
GGAGGCTAAC	TGACTCAGCG	GGCCCATGGG	CACATAGGTT	ATTTGGGAGA	ACGTCAACGT	6420
TCCGACTTGT	GGTCTCGCTG	TTCCTTGCGA	GGGTCTCCTC	TGAGTGATTG	ACTACCCGTC	6480
AGGCTGAACA	CCAGAGCGAC	AAGGAACCCT	CCCAGAGGAG	ACTCACTAAC	TGATGGGCAG	6480
AGCGGGGGTC	TTTCATTCAT	GCAGCATGTA	TCAAAATTAA	TTTGGTTTTT	TTTCTTAAGT	6540
TCGCCCCCAG	AAAGTAAGTA	CGTCGTACAT	AGTTTTAATT	AAACCAAAAA	AAAGAATTCA	6540
ATTTACATTA	AATGGCCATA	GTTGCATTAA	TGAATCGGCC	AACGCGCGGG	GAGAGGCGGT	6600
TAAATGTAAT	TTACCGGTAT	CAACGTAATT	ACTTAGCCGG	TTGCGCGCCC	CTCTCCGCCA	6600
AACGCATAAC	CGCGAGAAGG	CGAAGGAGCG	AGTGACTGAG	CGACGCGAGC	CAGCAAGCCG	6660
TTGCGTATTG	GCGCTCTTCC	GCTTCCTCGC	TCACTGACTC	GCTGCGCTCG	GTCGTTCCGC	6660
TGCGGCGAGC	GGTATCAGCT	CACTCAAAGG	CGGTAATACG	GTTATCCACA	GAATCAGGGG	6720
ACGCCGCTCG	CCATAGTCGA	GTGAGTTTCC	GCCATTATGC	CAATAGGTGT	CTTAGTCCCC	6720
ATAACGCAGG	AAAGAACATG	TGAGCAAAAAG	GCCAGCAAAA	GGCCAGGAAC	CGTAAAAAGG	6780
TATTGCGTCC	TTTCTTGATC	ACTCGTTTTT	CGGTCGTTTT	CCGGTCCTTG	GCATTTTTCC	6780
CCGCGTTGCT	GGCGTTTTTC	CATAGGCTCC	GCCCCCCTGA	CGAGCATCAC	AAAAATCGAC	6840
GGCGCAACGA	CCGCAAAAAG	GTATCCGAGG	CGGGGGGACT	GCTCGTAGTG	TTTTTAGCTG	6840
GCTCAAGTCA	GAGGTGGCGA	AACCCGACAG	GACTATAAAG	ATACCAGGCG	TTTCCCCCTG	6900
CGAGTTCAGT	CTCCACCGCT	TTGGGCTGTC	CTGATATTTT	TATGGTCCGC	AAAGGGGGAC	6900
GAAGCTCCCT	CGTGCGCTCT	CCTGTTCCGA	CCCTGCCGCT	TACCGGATAC	CTGTCCGCCT	6960
CTTCGAGGGA	GCACGCGAGA	GGACAAGGCT	GGGACGGCGA	ATGGCCTATG	GACAGGCGGA	6960
TTCTCCCTTC	GGGAAGCGTG	GCGCTTTCTC	ATAGCTCACG	CTGTAGGTAT	CTCAGTTCGG	7020
AAGAGGGAAG	CCCTTCGCAC	CGCGAAAGAG	TATCGAGTGC	GACATCCATA	GAGTCAAGCC	7020

FIG.11J



43/78

## pICAST ALN

TGTAGGTCGT	TCGCTCCAAG	CTGGGCTGTG	TGCACGAACC	CCCCGTTGAG	CCCGACCGCT	7080
ACATCCAGCA	AGCGAGGTTC	GACCCGACAC	ACGTGCTTGG	GGGGCAAGTC	GGGCTGGCGA	7080
GCGCCTTATC	CGGTAACAT	CGTCTTGAGT	CCAACCCGGT	AAGACACGAC	TTATCGCCAC	7140
CGCGGAATAG	GCCATTGATA	GCAGAACTCA	GGTTGGGCCA	TTCTGTGCTG	AATAGCGGTG	7140
TGGCAGCAGC	CACTGGTAAC	AGGATTAGCA	GAGCGAGGTA	TGTAGGCGGT	GCTACAGAGT	7200
ACCGTCGTCG	GTGACCATTG	TCCTAATCGT	CTCGCTCCAT	ACATCCGCCA	CGATGTCTCA	7200
TCTTGAAGTG	GTGGCCTAAC	TACGGCTACA	CTAGAAGAAC	AGTATTTGGT	ATCTGCGCTC	7260
AGAACTTCAC	CACCGGATTG	ATGCCGATGT	GATCTTCTTG	TCATAAACCA	TAGACGCGAG	7260
TGCTGAAGCC	AGTTACCTTC	GGAAAAAGAG	TTGGTAGCTC	TTGATCCGGC	AAACAAACCA	7320
ACGACTTCGG	TCAATGGAAG	CCTTTTTCTC	AACCATCGAG	AACTAGGCCG	TTTGTTTGGT	7320
CCGCTGGTAG	CGGTGGTTTT	TTTGTTTGCA	AGCAGCAGAT	TACGCGCAGA	AAAAAAGGAT	7380
GGCGACCATC	GCCACCAAAA	AAACAAACGT	TCGTCGTCTA	ATGCGCGTCT	TTTTTTCCTA	7380
CTCAAGAAGA	TCCTTTGATC	TTTTCTACGG	GGTCTGACGC	TCAGTGGAAC	GAAAACTCAC	7440
GAGTTCTTCT	AGGAAACTAG	AAAAGATGCC	CCAGACTGCG	AGTCACCTTG	CTTTTGAGTG	7440
GTAAAGGGAT	TTTGGTCATG	AGATTATCAA	AAAGGATCTT	CACCTAGATC	CTTTTGCGGC	7500
CAATTCCCTA	AAACCAGTAC	TCTAATAGTT	TTTCCTAGAA	GTGGATCTAG	GAAAACGCCG	7500
CGCAAATCAA	TCTAAAGTAT	ATATGAGTAA	ACTTGGTCTG	ACAGTTACCA	ATGCTTAATC	7560
GCGTTTAGTT	AGATTTTATA	TATACTCATT	TGAACCAGAC	TGTCAATGGT	TACGAATTAG	7560
AGTGAGGCAC	CTATCTCAGC	GATCTGTCTA	TTTCGTTTCAT	CCATAGTTGC	CTGACTCCCC	7620
TCACTCCGTG	GATAGAGTCG	CTAGACAGAT	AAAGCAAGTA	GGTATCAACG	GACTGAGGGG	7620
GTCGTGTAGA	TAACACGAT	ACGGGAGGGC	TTACCATCTG	GCCCCAGTGC	TGCAATGATA	7680
CAGCACATCT	ATTGATGCTA	TGCCCTCCCG	AATGGTAGAC	CGGGGTCACG	ACGTTACTAT	7680
CCGCGAGACC	CACGCTCACC	GGCTCCAGAT	TTATCAGCAA	TAAACCAGCC	AGCCGGAAGG	7740
GGCGCTCTGG	GTGCGAGTGG	CCGAGGTCTA	AATAGTCGTT	ATTTGGTCGG	TCGGCCTTCC	7740
GCCGAGCGCA	GAAGTGGTCC	TGCAACTTTA	TCCGCCTCCA	TCCAGTCTAT	TAATTGTTGC	7800
CGGCTCGCGT	CTTACCAGG	ACGTTGAAAT	AGGCGGAGGT	AGGTCAGATA	ATTAACAACG	7800

FIG. 11K



44/78

pICAST ALN

CGGGAAGCTA	GAGTAAGTAG	TTCGCCAGTT	AATAGTTTGC	GCAACGTTGT	TGCCATTGCT	7860
GCCCTTCGAT	CTCATTTCATC	AAGCGGTCAA	TTATCAAACG	CGTTGCAACA	ACGGTAACGA	7860
ACAGGCATCG	TGGTGTCACG	CTCGTCGTTT	GGTATGGCTT	CATTCAAGCTC	CGGTTCCCAA	7920
TGTCCGTAGC	ACCACAGTGC	GAGCAGCAAA	CCATACCGAA	GTAAGTCGAG	GCCAAGGGTT	7920
CGATCAAGGC	GAGTTACATG	ATCCCCCATG	TTGTGCAAAA	AAGCGGTTAG	CTCCTTCGGT	7980
GCTAGTTCCG	CTCAATGTAC	TAGGGGGTAC	AACACGTTTT	TTCGCCAATC	GAGGAAGCCA	7980
CCTCCGATCG	TTGTCAGAAG	TAAGTTGGCC	GCAGTGTTAT	CACTCATGGT	TATGGCAGCA	8040
GGAGGCTAGC	AACAGTCTTC	ATTCAACCGG	CGTCACAATA	GTGAGTACCA	ATACCGTCGT	8040
CTGCATAATT	CTCTTACTGT	CATGCCATCC	GTAAGATGCT	TTTCTGTGAC	TGGTGAGTAC	8100
GACGTATTAA	GAGAATGACA	GTACGGTAGG	CATTCTACGA	AAAGACACTG	ACCACTCATG	8100
TCAACCAAGT	CATTCTGAGA	ATAGTGTATG	CGGCGACCGA	GTTGCTCTTG	CCCGGCGTCA	8160
AGTTGGTTCA	GTAAGACTCT	TATCACATAC	GCCGCTGGCT	CAACGAGAAC	GGGCCGCGAGT	8160
ATACGGGATA	ATACCGCGCC	ACATAGCAGA	ACTTTAAAAG	TGCTCATCAT	TGGAAAACGT	8220
TATGCCCTAT	TATGGCGCGG	TGTATCGTCT	TGAAATTTTC	ACGAGTAGTA	ACCTTTTGCA	8220
TCTTCGGGGC	GAAAACTCTC	AAGGATCTTA	CCGCTGTTGA	GATCCAGTTC	GATGTAACCC	8280
AGAAGCCCCG	CTTTTGAGAG	TTCCTAGAAT	GGCGACAACT	CTAGGTCAAG	CTACATTGGG	8280
ACTCGTGCAC	CCAACTGATC	TTCAGCATCT	TTTACTTTCA	CCAGCGTTTC	TGGGTGAGCA	8340
TGAGCACGTG	GGTTGACTAG	AAGTCGTAGA	AAATGAAAGT	GGTCGCAAAG	ACCACTCGT	8340
AAAACAGGAA	GGCAAAATGC	CGCAAAAAAG	GGAATAAGGG	CGACACGGAA	ATGTTGAATA	8400
TTTTGTCTT	CCGTTTTACG	GCGTTTTTTC	CCTTATTCCC	GCTGTGCCTT	TACAACTTAT	8400
CTCATACTCT	TCCTTTTTCA	ATATTATTGA	AGCATTTATC	AGGGTTATTG	TCTCATGAGC	8460
GAGTATGAGA	AGGAAAAAGT	TATAATAACT	TCGTAAATAG	TCCAATAAC	AGAGTACTCG	8460
GGATACATAT	TTGAATGTAT	TTAGAAAAAT	AAACAAATAG	GGGTTCCGCG	CACATTTTC	8518
CCTATGTATA	AACTTACATA	AATCTTTTTA	TTTGTTTATC	CCCAAGGCGC	GTGTAAAG	8518

FIG. 1 1L

45/78

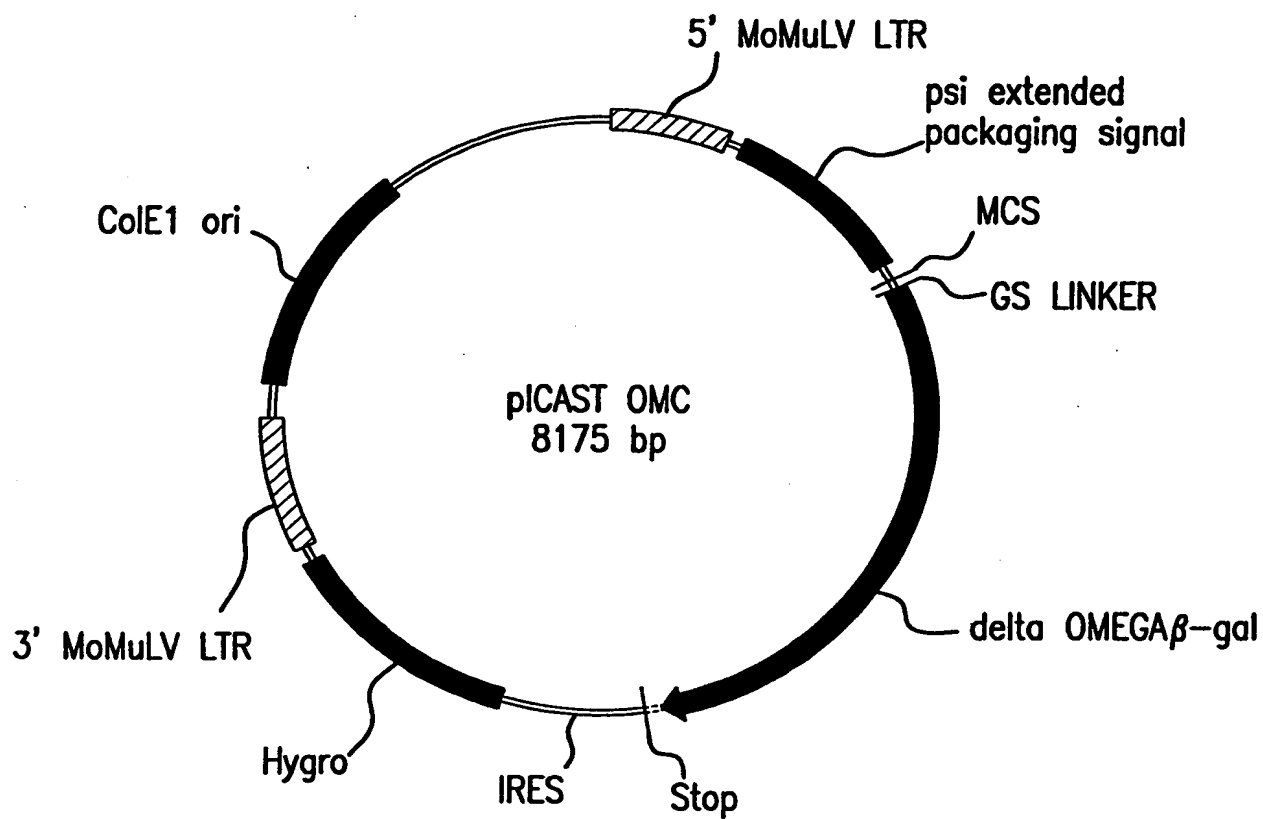


FIG.12A



46/78

pICAST OMC

CTGCAGCCTG	AATATGGGCC	AAACAGGATA	TCTGTGGTAA	GCAGTTCCTG	CCCCGGCTCA	60
GACGTCGGAC	TTATACCCGG	TTTGTCTAT	AGACACCATT	CGTCAAGGAC	GGGGCCGAGT	60
GGGCCAAGAA	CAGATGGAAC	AGCTGAATAT	GGGCCAAACA	GGATATCTGT	GGTAAGCAGT	120
CCCGGTTCTT	GTCTACCTTG	TCGACTTATA	CCCGGTTTGT	CCTATAGACA	CCATTTCGTCA	120
TCCTGCCCCG	GCTCAGGGCC	AAGAACAGAT	GGTCCCCAGA	TGCGGTCCAG	CCCTCAGCAG	180
AGGACGGGGC	CGAGTCCCGG	TTCTTGTCTA	CCAGGGGTCT	ACGCCAGGTC	GGGAGTCGTC	180
TTTCTAGAGA	ACCATCAGAT	GTTTCCAGGG	TGCCCCAAGG	ACCTGAAATG	ACCCTGTGCC	240
AAAGATCTCT	TGGTAGTCTA	CAAAGGTCCC	ACGGGGTTCC	TGGACTTTAC	TGGGACACGG	240
TTATTTGAAC	TAACCAATCA	GTTTCGTTCT	CGCTTCTGTT	CGCGCGCTTC	TGCTCCCCGA	300
AATAAACTTG	ATTGGTTAGT	CAAGCGAAGA	GCGAAGACAA	GCGCGCGAAG	ACGAGGGGCT	300
GCTCAATAAA	AGAGCCCACA	ACCCCTCACT	CGGGGCGCCA	GTCCTCCGAT	TGACTGAGTC	360
CGAGTTATTT	TCTCGGGTGT	TGGGGAGTGA	GCCCCGCGGT	CAGGAGGCTA	ACTGACTCAG	360
GCCCCGGGTAC	CCGTGTATCC	AATAAACCCCT	CTTGCA GTTG	CATCCGACTT	GTGGTCTCGC	420
CGGGCCCCATG	GGCACATAGG	TTATTTGGGA	GAACGTCAAC	GTAGGCTGAA	CACCAGAGCG	420
TGTTCCCTTGG	GAGGYTCTCC	TCTGAGTGAT	TGACTACCCG	TCAGCGGGGG	TCTTTCATTT	480
ACAAGGAACC	CTCCCAGAGG	AGACTCACTA	ACTGATGGGC	AGTCGCCCCC	AGAAAGTAAA	480
GGGGGCTCGT	CCGGGATCGG	GAGACCCCTG	CCCAGGGACC	ACCGACCCAC	CACCGGGAGG	540
CCCCCGAGCA	GGCCCTAGCC	CTCTGGGGAC	GGGTCCCTGG	TGGCTGGGTG	GTGGCCCTCC	540
CAAGCTGGCC	AGCAACTTAT	CTGTGTCTGT	CCGATTGTCT	AGTGTCTATG	ACTGATTTTA	600
GTTTCGACCGG	TCGTTGAATA	GACACAGACA	GGCTAACAGA	TCACAGATAC	TGACTAAAAT	600
TGCGCCTGCG	TCGGTACTAG	TTAGCTAACT	AGCTCTGTAT	CTGGCGGACC	CGTGGTGGAA	660
ACGCGGACGC	AGCCATGATC	AATCGATTGA	TCGAGACATA	GACCGCCTGG	GCACCACCTT	660
CTGACGAGTT	CTGAACACCC	GGCCGCAACC	CTGGGAGACG	TCCCAGGGAC	TTTGGGGGCC	720
GACTGCTCAA	GACTTGTGGG	CCGGCGTTGG	GACCCTCTGC	AGGGTCCCTG	AAACCCCCGG	720
GTTTTTGTGG	CCCGACCTGA	GGAAGGGAGT	CGATGTGGAA	TCCGACCCCG	TCAGGATATG	780
CAAAAACACC	GGGCTGGACT	CCTTCCCTCA	GCTACACCTT	AGGCTGGGGC	AGTCCTATAC	780

FIG.12B



47/78

pICAST OMC

TGGTTCTGGT	AGGAGACGAG	AACCTAAAC	AGTTCCCGCC	TCCGTCTGAA	TTTTTGCTTT	840
ACCAAGACCA	TCCTCTGCTC	TTGGATTTTG	TCAAGGGCGG	AGGCAGACTT	AAAAACGAAA	840
CGGTTTGGA	CCGAAGCCGC	GCGTCTTGTC	TGCTGCAGCA	TCGTTCTGTG	TTGTCTCTGT	900
GCCAAACCTT	GGCTTCGGCG	CGCAGAACAG	ACGACGTCGT	AGCAAGACAC	AACAGAGACA	900
CTGACTGTGT	TTCTGTATTT	GTCTGAAAAT	TAGGGCCAGA	CTGTTACCAC	TCCCTTAAGT	960
GACTGACACA	AAGACATAAA	CAGACTTTTA	ATCCCGGTCT	GACAATGGTG	AGGGAATTCA	960
TTGACCTTAG	GTAAGTGGAA	AGATGTCGAG	CGGCTCGCTC	ACAACCAGTC	GGTAGATGTC	1020
AACTGGAATC	CATTGACCTT	TCTACAGCTC	GCCGAGCGAG	TGTTGGTCAG	CCATCTACAG	1020
AAGAAGAGAC	GTTGGGTTAC	CTTCTGCTCT	GCAGAATGGC	CAACCTTTAA	CGTCGGATGG	1080
TTCTTCTCTG	CAACCCAATG	GAAGACGAGA	CGTCTTACCG	GTTGGAAATT	GCAGCCTACC	1080
CCGCGAGACG	GCACCTTTAA	CCGAGACCTC	ATCACCAGG	TTAAGATCAA	GGTCTTTTCA	1140
GGCGCTCTGC	CGTGGAATTT	GGCTCTGGAG	TAGTGGGTCC	AATTCTAGTT	CCAGAAAAGT	1140
CCTGGCCCGC	ATGGACACCC	AGACCAGGTC	CCCTACATCG	TGACCTGGGA	AGCCTTGGCT	1200
GGACCGGGCG	TACCTGTGGG	TCTGGTCCAG	GGGATGTAGC	ACTGGACCCT	TCGGAACCGA	1200
TTTGACCCCC	CTCCCTGGGT	CAAGCCCTTT	GTACACCCTA	AGCCTCCGCC	TCCTCTTCCT	1260
AACTGGGGG	GAGGGACCCA	GTTCCGGGAA	CATGTGGGAT	TCGGAGGCGG	AGGAGAAGGA	1260
CCATCCGCCC	CGTCTCTCCC	CCTTGAACCT	CCTCGTTCGA	CCCCGCCTCG	ATCCTCCCTT	1320
GGTAGGCGGG	GCAGAGAGGG	GGAACCTGGA	GGAGCAAGCT	GGGGCGGAGC	TAGGAGGGAA	1320
TATCCAGCCC	TACTCCTTC	TCTAGGCGCC	GGCCGCTCTA	GCCCATTAAT	ACGACTCACT	1380
ATAGGTCGGG	AGTGAGGAAG	AGATCCGCGG	CCGGCGAGAT	CGGGTAATTA	TGCTGAGTGA	1380
ATAGGGCGAT	TCGAATCAGG	CCTTGGCGCG	CCGGATCCTT	AATTAAGCGC	AATTGGGAGG	1440
TATCCCGCTA	AGCTTAGTCC	GGAACCGCGC	GGCCTAGGAA	TTAATTCGCG	TTAACCCTCC	1440
TGGCGGTAGC	CTCGAGATGG	GCGTGATTAC	GGATTCACTG	GCCGTCGTTT	TACAACGTCG	1500
ACCGCCATCG	GAGCTCTACC	CGCACTAATG	CCTAAGTGAC	CGGCAGCAAA	ATGTTGCAGC	1500
TGACTGGGAA	AACCCTGGCG	TTACCCAACT	TAATCGCCTT	GCAGCACATC	CCCCTTTTCG	1560
ACTGACCCTT	TTGGGACCGC	AATGGGTTGA	ATTAGCGGAA	CGTCGTGTAG	GGGGAAAGCG	1560

FIG.12C



48/78

pICAST OMC

CAGCTGGCGT	AATAGCGAAG	AGGCCCGCAC	CGATCGCCCT	TCCCAACAGT	TACGCAGCCT	1620
GTCGACCGCA	TTATCGCTTC	TCCGGGCGTG	GCTAGCGGGA	AGGGTTGTCA	ATGCGTCGGA	1620
GAATGGCGAA	TGGCGCTTTG	CCTGGTTTCC	GGCACCAGAA	GCGGTGCCGG	AAAGCTGGCT	1680
CTTACCGCTT	ACCGCGAAAC	GGACCAAAGG	CCGTGGTCTT	CGCCACGGCC	TTTCGACCGA	1680
GGAGTGCGAT	CTTCCTGAGG	CCGATACTGT	CGTCGTCCCC	TCAAACCTGGC	AGATGCACGG	1740
CCTCACGCTA	GAAGGACTCC	GGCTATGACA	GCAGCAGGGG	AGTTTGACCG	TCTACGTGCC	1740
TTACGATGCG	CCCATCTACA	CCAACGTGAC	CTATCCCATT	ACGGTCAATC	CGCCGTTTGT	1800
AATGCTACGC	GGGTAGATGT	GGTTGCACTG	GATAGGGTAA	TGCCAGTTAG	GCGGCAAACA	1800
TCCCACGGAG	AATCCGACGG	GTTGTTACTC	GCTCACATTT	AATGTTGATG	AAAGCTGGCT	1860
AGGGTGCCTC	TTAGGCTGCC	CAACAATGAG	CGAGTGTAAG	TTACAACCTAC	TTTCGACCGA	1860
ACAGGAAGGC	CAGACGCGAA	TTATTTTTGA	TGGCGTTAAC	TCGGCGTTTC	ATCTGTGGTG	1920
TGTCCTTCCG	GTCTGCGCTT	AATAAAACT	ACCGCAATTG	AGCCGCAAAG	TAGACACCAC	1920
CAACGGGCGC	TGGGTCGGTT	ACGGCCAGGA	CAGTCGTTTG	CCGTCTGAAT	TTGACCTGAG	1980
GTTGCCCGCG	ACCCAGCCAA	TGCCGGTCCT	GTCAGCAAAC	GGCAGACTTA	AACTGGACTC	1980
CGCATTTTTA	CGCGCCGGAG	AAAACCGCCT	CGCGGTGATG	GTGCTGCGCT	GGAGTGACGG	2040
GCGTAAAAAT	GCGCGGCCTC	TTTTGGCGGA	GCGCCACTAC	CACGACGCGA	CCTCACTGCC	2040
CAGTTATCTG	GAAGATCAGG	ATATGTGGCG	GATGAGCGGC	ATTTTCCGTG	ACGTCTCGTT	2100
GTCAATAGAC	CTTCTAGTCC	TATACACCGC	CTACTCGCCG	TAAAAGGCAC	TGCAGAGCAA	2100
GCTGCATAAA	CCGACTACAC	AAATCAGCGA	TTTCCATGTT	GCCACTCGCT	TTAATGATGA	2160
CGACGTATTT	GGCTGATGTG	TTTAGTCGCT	AAAGGTACAA	CGGTGAGCGA	AATTACTACT	2160
TTTCAGCCGC	GCTGTACTGG	AGGCTGAAGT	TCAGATGTGC	GGCGAGTTGC	GTGACTACCT	2220
AAAGTCGGCG	CGACATGACC	TCCGACTTCA	AGTCTACACG	CCGCTCAACG	CACTGATGGA	2220
ACGGGTAACA	GTTTCTTTAT	GGCAGGGTGA	AACGCAGGTC	GCCAGCGGCA	CCGCGCCTTT	2280
TGCCCATTGT	CAAAGAAATA	CCGTCCCACT	TTGCGTCCAG	CGGTCGCCGT	GGCGCGGAAA	2280
CGGCGGTGAA	ATTATCGATG	AGCGTGGTGG	TTATGCCGAT	CGCGTCACAC	TACGTCTGAA	2340
GCCGCCACTT	TAATAGCTAC	TCGCACCACC	AATACGGCTA	GCGCAGTGTG	ATGCAGACTT	2340

FIG.12D





49/78

pICAST OMC

CGTCGAAAAC	CCGAAACTGT	GGAGCGCCGA	AATCCCGAAT	CTCTATCGTG	CGGTGGTTGA	2400
GCAGCTTTTG	GGCTTTGACA	CCTCGCGGCT	TTAGGGCTTA	GAGATAGCAC	GCCACCAACT	2400
ACTGCACACC	GCCGACGGCA	CGCTGATTGA	AGCAGAAGCC	TGCGATGTCG	GTTTCCGCGA	2460
TGACGTGTGG	CGGCTGCCGT	GCGACTAACT	TCGTCTTCGG	ACGCTACAGC	CAAAGGCGCT	2460
GGTGCGGATT	GAAAATGGTC	TGCTGCTGCT	GAACGGCAAG	CCGTTGCTGA	TTCGAGGCGT	2520
CCACGCCTAA	CTTTTACCAG	ACGACGACGA	CTTGCCGTTC	GGCAACGACT	AAGCTCCGCA	2520
TAACCGTCAC	GAGCATCATC	CTCTGCATGG	TCAGGTCATG	GATGAGCAGA	CGATGGTGCA	2580
ATTGGCAGTG	CTCGTAGTAG	GAGACGTACC	AGTCCAGTAC	CTACTCGTCT	GCTACCACGT	2580
GGATATCCTG	CTGATGAAGC	AGAACAACCT	TAACGCCGTG	CGCTGTTTCG	ATTATCCGAA	2640
CCTATAGGAC	GACTACTTCG	TCTTGTTGAA	ATTGCGGCAC	GCGACAAGCG	TAATAGGCTT	2640
CCATCCGCTG	TGGTACACGC	TGTGCGACCG	CTACGGCCTG	TATGTGGTGG	ATGAAGCCAA	2700
GGTAGGCGAC	ACCATGTGCG	ACACGCTGGC	GATGCCGGAC	ATACACCACC	TACTTCGGTT	2700
TATTGAAACC	CACGGCATGG	TGCCAATGAA	TCGTCTGACC	GATGATCCGC	GCTGGCTACC	2760
ATAACTTTGG	GTGCCGTACC	ACGGTTACTT	AGCAGACTGG	CTACTAGGCG	CGACCGATGG	2760
GGCGATGAGC	GAACGCGTAA	CGCGAATGGT	GCAGCGCGAT	CGTAATCACC	CGAGTGTGAT	2820
CCGCTACTCG	CTTGCGCATT	GCGCTTACCA	CGTCGCGCTA	GCATTAGTGG	GCTCACACTA	2820
CATCTGGTCG	CTGGGGAATG	AATCAGGCCA	CGGCGCTAAT	CACGACGCGC	TGTATCGCTG	2880
GTAGACCAGC	GACCCCTTAC	TTAGTCCGGT	GCCGCGATTA	GTGCTGCGCG	ACATAGCGAC	2880
GATCAAATCT	GTCGATCCTT	CCGCCCCGGT	GCAGTATGAA	GGCGGCGGAG	CCGACACCAC	2940
CTAGTTTAGA	CAGCTAGGAA	GGGCGGGCCA	CGTCATACTT	CCGCCGCCTC	GGCTGTGGTG	2940
GGCCACCGAT	ATTATTTGCC	CGATGTACGC	GCGCGTGGAT	GAAGACCAGC	CCTTCCCGGC	3000
CCGGTGGCTA	TAATAAACGG	GCTACATGCG	GCGGCACCTA	CTTCTGGTCG	GGAAGGGCCG	3000
TGTGCCGAAA	TGGTCCATCA	AAAAATGGCT	TTCGCTACCT	GGAGAGACGC	GCCCCGCTGAT	3060
ACACGGCTTT	ACCAGGTAGT	TTTTTACCGA	AAGCGATGGA	CCTCTCTGCG	CGGGCGACTA	3060
CCTTTGCGAA	TACGCCACG	CGATGGGTAA	CAGTCTTGGC	GGTTTCGCTA	AATACTGGCA	3120
GGAAACGCTT	ATGCGGGTGC	GCTACCCATT	GTCAGAACCG	CCAAAGCGAT	TTATGACCGT	3120

FIG.12E



50/78

pICAST OMC

GGCGTTTCGT	CAGTATCCCC	GTTTACAGGG	CGGCTTCGTC	TGGGACTGGG	TGGATCAGTC	3180
CCGCAAAGCA	GTCATAGGGG	CAAATGTCCC	GCCGAAGCAG	ACCCTGACCC	ACCTAGTCAG	3180
GCTGATTAAA	TATGATGAAA	ACGGCAACCC	GTGGTCGGCT	TACGGCGGTG	ATTTTGGCGA	3240
CGACTAATTT	ATACTACTTT	TGCCGTTGGG	CACCAGCCGA	ATGCCGCCAC	TAAAACCGCT	3240
TACGCCGAAC	GATCGCCAGT	TCTGTATGAA	CGGTCTGGTC	TTTGCCGACC	GCACGCCGCA	3300
ATGCGGCTTG	CTAGCGGTCA	AGACATACTT	GCCAGACCAG	AAACGGCTGG	CGTGCGGCGT	3300
TCCAGCGCTG	ACGGAAGCAA	AACACCAGCA	GCAGTTTTTC	CAGTTCCGTT	TATCCGGGCA	3360
AGGTCGCGAC	TGCCTTCGTT	TTGTGGTCGT	CGTCAAAAAG	GTCAAGGCAA	ATAGGCCCGT	3360
AACCATCGAA	GTGACCAGCG	AATACCTGTT	CCGTCATAGC	GATAACGAGC	TCCTGCACTG	3420
TTGGTAGCTT	CACTGGTCGC	TTATGGACAA	GGCAGTATCG	CTATTGCTCG	AGGACGTGAC	3420
GATGGTGGCG	CTGGATGGTA	AGCCGCTGGC	AAGCGGTGAA	GTGCCTCTGG	ATGTCGCTCC	3480
CTACCACCGC	GACCTACCAT	TCGGCGACCG	TTCGCCACTT	CACGGAGACC	TACAGCGAGG	3480
ACAAGGTAAA	CAGTTGATTG	AACTGCCTGA	ACTACCGCAG	CCGGAGAGCG	CCGGGCAACT	3540
TGTTCCATTT	GTCAACTAAC	TTGACGGACT	TGATGGCGTC	GGCCTCTCGC	GGCCCGTTGA	3540
CTGGCTCACA	GTACGCGTAG	TGCAACCGAA	CGCGACCGCA	TGGTCAGAAG	CCGGGCACAT	3600
GACCGAGTGT	CATGCGCATC	ACGTTGGCTT	GCGCTGGCGT	ACCAGTCTTC	GGCCCGTGTA	3600
CAGCGCCTGG	CAGCAGTGGC	GTCTGGCGGA	AAACCTCAGT	GTGACGCTCC	CCGCCGCGTC	3660
GTCGCGGACC	GTCGTCAACG	CAGACCGCCT	TTTGGAGTCA	CACTGCGAGG	GGCGGCGCAG	3660
CCACGCCATC	CCGCATCTGA	CCACCAGCGA	AATGGATTTT	TGCATCGAGC	TGGGTAATAA	3720
GGTGCGGTAG	GGCGTAGACT	GGTGGTCGCT	TTACCTAAAA	ACGTAGCTCG	ACCCATTATT	3720
GCGTTGGCAA	TTTAACCGCC	AGTCAGGCTT	TCTTTCACAG	ATGTGGATTG	GCGATAAAAA	3780
CGCAACCGTT	AAATTGGCGG	TCAGTCCGAA	AGAAAGTGTC	TACACCTAAC	CGCTATTTTT	3780
ACAACTGCTG	ACGCCGCTGC	GCGATCAGTT	CACCCGTGTC	GATAGATCTG	AACAGAAACT	3840
TGTTGACGAC	TGCGGCGACG	CGCTAGTCAA	GTGGGCACAG	CTATCTAGAC	TTGTCTTTGA	3840
CATTTCCGAA	GAAGACCTAG	TCGACCATCA	TCATCATCAT	CACCGGTAAT	AATAGGTAGA	3900
GTAAAGGCTT	CTTCTGGATC	AGCTGGTAGT	AGTAGTAGTA	GTGGCCATTA	TTATCCATCT	3900

FIG.12F

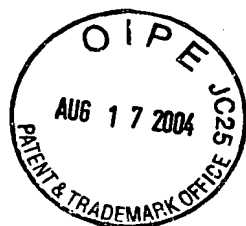


51/78

pICAST OMC

TAAGTGA CTG	ATTAGATGCA	TTTCGACTAG	ATCCCTCGAC	CAATTCCGGT	TATTTTCCAC	3960
ATTCACTGAC	TAATCTACGT	AAAGCTGATC	TAGGGAGCTG	GTAAAGGCCA	ATAAAAGGTG	3960
CATATTGCCG	TCTTTTGGCA	ATGTGAGGGC	CCGGAACCT	GGCCCTGTCT	TCTTGACGAG	4020
GTATAACGGC	AGAAAACCGT	TACACTCCCG	GGCCTTTGGA	CCGGGACAGA	AGAACTGCTC	4020
CATTCCTAGG	GGTCTTTCCC	CTCTCGCCAA	AGGAATGCAA	GGTCTGTTGA	ATGTCGTGAA	4080
GTAAGGATCC	CCAGAAAGGG	GAGAGCGGTT	TCCTTACGTT	CCAGACA ACT	TACAGCACTT	4080
GGAAGCAGTT	CCTCTGGAAG	CTTCTTGAAG	ACAAACAACG	TCTGTAGCGA	CCCTTTGCAG	4140
CCTTCGTCAA	GGAGACCTTC	GAAGAACTTC	TGTTTGTTGC	AGACATCGCT	GGGAAACGTC	4140
GCAGCGGAAC	CCCCCACCTG	GCGACAGGTG	CCTCTGCGGC	CAAAAGCCAC	GTGTATAAGA	4200
CGTCGCCTTG	GGGGGTGGAC	CGCTGTCCAC	GGAGACGCCG	GTTTTCGGTG	CACATATTCT	4200
TACACCTGCA	AAGGCGGCAC	AACCCCACTG	CCACGTTGTG	AGTTGGATAG	TTGTGGAAAG	4260
ATGTGGACGT	TTCCGCCGTG	TTGGGGTCAC	GGTGCAACAC	TCAACCTATC	AACACCTTTC	4260
AGTCAAATGG	CTCTCCTCAA	GCGTATTCAA	CAAGGGGCTG	AAGGATGCCC	AGAAGGTACC	4320
TCAGTTTACC	GAGAGGAGTT	CGCATAAGTT	GTTCCCCGAC	TTCCTACGGG	TCTTCCATGG	4320
CCATTGTATG	GGATCTGATC	TGGGGCCTCG	GTGCACATGC	TTTACATGTG	TTTAGTCGAG	4380
GGTAACATAC	CCTAGACTAG	ACCCCGGAGC	CACGTGTACG	AAATGTACAC	AAATCAGCTC	4380
GTAAAAAAC	GTCTAGGCCC	CCCGAACCAC	GGGGACGTGG	TTTTCTTTTG	AAAAACACGA	4440
CAATTTTTTG	CAGATCCGGG	GGGCTTG GTG	CCCCTGCACC	AAAAGGAAAC	TTTTTG TGCT	4440
TGATAATACC	ATGAAAAAGC	CTGAACTCAC	CGCGACGTCT	GTCGAGAAGT	TTCTGATCGA	4500
ACTATTATGG	TACTTTTTCG	GACTTGAGTG	GCGCTGCAGA	CAGCTCTTCA	AAGACTAGCT	4500
AAAGTTCGAC	AGCGTCTCCG	ACCTGATGCA	GCTCTCGGAG	GGCGAAGAAT	CTCGTGCTTT	4560
TTTCAAGCTG	TCGCAGAGGC	TGGACTACGT	CGAGAGCCTC	CCGCTTCTTA	GAGCACGAAA	4560
CAGCTTCGAT	GTAGGAGGGC	GTGGATATGT	CCTGCGGGTA	AATAGCTGCG	CCGATGGTTT	4620
GTCGAAGCTA	CATCCTCCCG	CACCTATACA	GGACGCCCAT	TTATCGACGC	GGCTACCAAA	4620
CTACAAAGAT	CGTTATGTTT	ATCGGCACTT	TGCATCGGCC	GCGCTCCCGA	TTCCGGAAGT	4680
GATGTTTCTA	GCAATACAAA	TAGCCGTGAA	ACGTAGCCGG	CGCGAGGGCT	AAGGCCTTCA	4680

FIG.12G



52/78

pICAST OMC

GCTTGACATT	GGGGAATTTA	GCGAGAGCCT	GACCTATTGC	ATCTCCCGCC	GTGCACAGGG	4740
CGAACTGTAA	CCCCTTAAAT	CGCRCTCGGA	CTGGATAACG	TAGAGGGCGG	CACGTGTCCC	4740
TGTCACGTTG	CAAGACCTGC	CTGAAACCGA	ACTGCCCGCT	GTTCTGCAGC	CGGTCGCGGA	4800
ACAGTGCAAC	GTTCTGGACG	GACTTTGGCT	TGACGGGCGA	CAAGACGTCG	GCCAGCGCCT	4800
GGCCATGGAT	GCGATCGCTG	CGGCCGATCT	TAGCCAGACG	AGCGGGTTCG	GCCCATTCTGG	4860
CCGGTACCTA	CGCTAGCGAC	GCCGGCTAGA	ATCGGTCTGC	TCGCCCAAGC	CGGGTAAGCC	4860
ACCGCAAGGA	ATCGGTCAAT	AACTACATG	GCGTGATTTC	ATATGCGCGA	TTGCTGATCC	4920
TGGCGTTCCT	TAGCCAGTTA	TGTGATGTAC	CGCACTAAAG	TATACGCGCT	AACGACTAGG	4920
CCATGTGTAT	CACTGGCAAA	CTGTGATGGA	CGACACCGTC	AGTGCGTCCG	TCGCGCAGGC	4980
GGTACACATA	GTGACCGTTT	GACACTACCT	GCTGTGGCAG	TCACGCAGGC	AGCGCGTCCG	4980
TCTCGATGAG	CTGATGCTTT	GGGCCGAGGA	CTGCCCCGAA	GTCCGGCACC	TCGTGCACGC	5040
AGAGCTACTC	GACTACGAAA	CCCGGCTCCT	GACGGGGCTT	CAGGCCGTGG	AGCACGTGCG	5040
GGATTTCTGGC	TCCAACAATG	TCCTGACGGA	CAATGGCCGC	ATAACAGCGG	TCATTGACTG	5100
CCTAAAGCCG	AGGTTGTTAC	AGGACTGCCT	GTTACCGGCG	TATTGTCGCC	AGTAACTGAC	5100
GAGCGAGGCG	ATGTTCTGGG	ATTCCCAATA	CGAGGTCGCC	AACATCTTCT	TCTGGAGGCC	5160
CTCGCTCCGC	TACAAGCCCC	TAAGGGTTAT	GCTCCAGCGG	TTGTAGAAGA	AGACCTCCGG	5160
GTGGTTGGCT	TGTATGGAGC	AGCAGACGCG	CTACTTCGAG	CGGAGGCATC	CGGAGCTTGC	5220
CACCAACCGA	ACATACCTCG	TCGTCTGCGC	GATGAAGCTC	GCCTCCGTAG	GCCTCGAACG	5220
AGGATCGCCG	CGGCTCCGGG	CGTATATGCT	CCGCATTGGT	CTTGACCAAC	TCTATCAGAG	5280
TCCTAGCGGC	GCCGAGGCCC	GCAATATACG	GGCGTAACCA	GAACTGCTTG	AGATAGTCTC	5280
CTTGGTTGAC	GGCAATTTCTG	ATGATGCAGC	TTGGGCGCAG	GGTCGATGCG	ACGCAATCGT	5340
GAACCAACTG	CCGTTAAAGC	TACTACGTCG	AACCCGCGTC	CCAGCTACGC	TGCGTTAGCA	5340
CCGATCCGGA	GCCGGGACTG	TCGGGCGTAC	ACAAATCGCC	CGCAGAAGCG	CGGCCGTCTG	5400
GGCTAGGCCT	CGGCCCTGAC	AGCCCGCATG	TGTTTAGCGG	GCGTCTTCGC	GCCGGCAGAC	5400
GACCGATGGC	TGTGTAGAAG	TACTCGCCGA	TAGTGGAAC	CGACGCCCA	GCACTCGTCC	5460
CTGGCTACCG	ACACATCTTC	ATGAGCGGCT	ATCACCTTTG	GCTGCGGGGT	CGTGAGCAGG	5460

FIG.12H



53/78

pICAST OMC

GAGGGCAAAG	GAATAGAGTA	GATGCCGACC	GGGATCTATC	GATAAAATAA	AAGATTTTAT	5520
CTCCCGTTTC	CTTATCTCAT	CTACGGCTGG	CCCTAGATAG	CTATTTTATT	TTCTAAAATA	5520
TTAGTCTCCA	GAAAAAGGGG	GGAATGAAAG	ACCCACCTG	TAGGTTTGGC	AAGCTAGCTT	5580
AATCAGAGGT	CTTTTCCCC	CCTTACTTTC	TGGGGTGGAC	ATCCAAACCG	TTCGATCGAA	5580
AAGTAACGCC	ATTTTGCAAG	GCATGGAAAA	ATACATAACT	GAGAATAGAG	AAGTTCAGAT	5640
TTCATTGCGG	TAAACGTTT	CGTACCTTTT	TATGTATTGA	CTCTTATCTC	TTCAAGTCTA	5640
CAAGGTCAGG	AACAGATGGA	ACAGCTGAAT	ATGGGCCAAA	CAGGATATCT	GTGGTAAGCA	5700
GTTCCAGTCC	TTGTCTACCT	TGTCGACTTA	TACCCGTTT	GTCCTATAGA	CACCATTTCG	5700
GTTCCCTGCC	CGGCTCAGGG	CCAAGAACAG	ATGGAACAGC	TGAATATGGG	CCAAACAGGA	5760
CAAGGACGGG	GCCGAGTCCC	GGTTCCTGTC	TACCTTGTCG	ACTTATACCC	GGTTTGTCT	5760
TATCTGTGGT	AAGCAGTTCC	TGCCCCGGCT	CAGGGCCAAG	AACAGATGGT	CCCCAGATGC	5820
ATAGACACCA	TTCGTCAAGG	ACGGGGCCGA	GTCCCGTTT	TTGTCTACCA	GGGGTCTACG	5820
GGTCCAGCCC	TCAGCAGTTT	CTAGAGAACC	ATCAGATGTT	TCCAGGGTGC	CCAAGGACC	5880
CCAGGTCGGG	AGTCGTCAAA	GATCTCTTGG	TAGTCTACAA	AGGTCCCACG	GGGTTCTCTG	5880
TGAAATGACC	CTGTGCCTTA	TTTGAAGTAA	CCAATCAGTT	CGCTTCTCGC	TTCTGTTTCG	5940
ACTTTACTGG	GACACGGAAT	AACTTGATT	GGTTAGTCAA	GCGAAGAGCG	AAGACAAGCG	5940
GCGCTTCTGC	TCCCCGAGCT	CAATAAAAGA	GCCCACAACC	CCTCACTCGG	GGCGCCAGTC	6000
CGCGAAGACG	AGGGGCTCGA	GTTATTTTCT	CGGGTGTGG	GGAGTGAGCC	CCGCGGTCAG	6000
CTCCGATTGA	CTGAGTCGCC	CGGGTACCCG	TGTATCCAAT	AAACCCTCTT	GCAGTTGCAT	6060
GAGGCTAACT	GACTCAGCGG	GCCCATGGGC	ACATAGGTTA	TTGGGAGAA	CGTCAACGTA	6060
CCGACTTGTG	GTCTCGCTGT	TCCTTGGGAG	GGTCTCCTCT	GAGTGATTGA	CTACCCGTCA	6120
GGCTGAACAC	CAGAGCGACA	AGGAACCCTC	CCAGAGGAGA	CTCACTAACT	GATGGGCAGT	6120
GCGGGGGTCT	TTCATTCATG	CAGCATGTAT	CAAAATTAAT	TTGGTTTTTT	TTCTTAAGTA	6180
CGCCCCCAGA	AAGTAAGTAC	GTCGTACATA	GTTTAAATTA	AACCAAAAAA	AAGAATTCAT	6180
TTTACATTAA	ATGGCCATAG	TTGCATTAAT	GAATCGGCCA	ACGCGCGGGG	AGAGGCGGTT	6240
AAATGTAATT	TACCGGTATC	AACGTAATTA	CTTAGCCGGT	TGCGCGCCCC	TCTCCGCCAA	6240

FIG. 12I



54/78

pICAST OMC

TGCGTATTGG	CGCTCTTCCG	CTTCCTCGCT	CACTGACTCG	CTGCGCTCGG	TCGTTCGGCT	6300
ACGCATAACC	GCGAGAAGGC	GAAGGAGCGA	GTGACTGAGC	GACGCGAGCC	AGCAAGCCGA	6300
GCGGCGAGCG	GTATCAGCTC	ACTCAAAGGC	GGTAATACGG	TTATCCACAG	AATCAGGGGA	6360
CGCCGCTCGC	CATAGTCGAG	TGAGTTTCCG	CCATTATGCC	AATAGGTGTC	TTAGTCCCCT	6360
TAACGCAGGA	AAGAACATGT	GAGCAAAAGG	CCAGCAAAAG	GCCAGGAACC	GTAAAAAGGC	6420
ATTGCGTCCT	TTCTTGTACA	CTCGTTTTCC	GGTCGTTTTC	CGGTCCTTGG	CATTTTTCCG	6420
CGCGTTGCTG	GCGTTTTTCC	ATAGGCTCCG	CCCCCTGAC	GAGCATCACA	AAAATCGACG	6480
GCGCAACGAC	CGCAAAAAGG	TATCCGAGGC	GGGGGGACTG	CTCGTAGTGT	TTTAGCTGC	6480
CTCAAGTCAG	AGGTGGCGAA	ACCCGACAGG	ACTATAAAGA	TACCAGGCGT	TTCCCCCTGG	6540
GAGTTCAGTC	TCCACCGCTT	TGGGCTGTCC	TGATATTTCT	ATGGTCCGCA	AAGGGGGACC	6540
AAGCTCCCTC	GTGCGCTCTC	CTGTTCCGAC	CCTGCCGCTT	ACCGGATACC	TGTCCGCCTT	6600
TTCGAGGGAG	CACGCGAGAG	GACAAGGCTG	GGACGGCGAA	TGGCCTATGG	ACAGGCGGAA	6600
TCTCCCTTCG	GGAAGCGTGG	CGCTTTCTCA	TAGCTCACGC	TGTAGGTATC	TCAGTTCGGT	6660
AGAGGGAAGC	CCTTCGCACC	GCGAAAGAGT	ATCGAGTGCG	ACATCCATAG	AGTCAAGCCA	6660
GTAGGTCGTT	CGCTCCAAGC	TGGGCTGTGT	GCACGAACCC	CCCGTTCAGC	CCGACCGCTG	6720
CATCCAGCAA	GCGAGGTTCC	ACCCGACACA	CGTGCTTGGG	GGGCAAGTCG	GGCTGGCGAC	6720
CGCCTTATCC	GGTAACTATC	GTCTTGAGTC	CAACCCGGTA	AGACACGACT	TATCGCCACT	6780
GCGGAATAGG	CCATTGATAG	CAGAACTCAG	GTTGGGCCAT	TCTGTGCTGA	ATAGCGGTGA	6780
GGCAGCAGCC	ACTGGTAACA	GGATTAGCAG	AGCGAGGTAT	GTAGGCGGTG	CTACAGAGTT	6840
CCGTCGTCGG	TGACCATTGT	CCTAATCGTC	TCGCTCCATA	CATCCGCCAC	GATGTCTCAA	6840
CTTGAAGTGG	TGGCCTAACT	ACGGCTACAC	TAGAAGAACA	GTATTTGGTA	TCTGCGCTCT	6900
GAAC TTCACC	ACCGGATTGA	TGCCGATGTG	ATCTTCTTGT	CATAAACCAT	AGACGCGAGA	6900
GCTGAAGCCA	GTTACCTTCG	GAAAAAGAGT	TGGTAGCTCT	TGATCCGGCA	AACAAACCAC	6960
CGACTTCGGT	CAATGGAAGC	CTTTTTCTCA	ACCATCGAGA	ACTAGGCCGT	TTGTTTGGTG	6960
CGCTGGTAGC	GGTGGTTTTT	TTGTTTGCAA	GCAGCAGATT	ACGCGCAGAA	AAAAAGGATC	7020
GCGACCATCG	CCACCAAAAA	AACAAACGTT	CGTCGTCTAA	TGCGCGTCTT	TTTTTCCTAG	7020

FIG.12J



55/78

pICAST OMC

TCAAGAAGAT	CCTTTGATCT	TTTCTACGGG	GTCTGACGCT	CAGTGGAACG	AAAACTCACG	7080
AGTTCTTCTA	GGAAACTAGA	AAAGATGCCC	CAGACTGCGA	GTCACCTTGC	TTTTGAGTGC	7080
TTAAGGGATT	TTGGTCATGA	GATTATCAAA	AAGGATCTTC	ACCTAGATCC	TTTTAAATTA	7140
AATTCCCTAA	AACCAGTACT	CTAATAGTTT	TTCCTAGAAG	TGGATCTAGG	AAAATTTAAT	7140
AAAATGAAGT	TTGCGGCCGC	AAATCAATCT	AAAGTATATA	TGAGTAAACT	TGGTCTGACA	7200
TTTTACTTCA	AACGCCGGCG	TTTAGTTAGA	TTTCATATAT	ACTCATTTGA	ACCAGACTGT	7200
GTTACCAATG	CTTAATCAGT	GAGGCACCTA	TCTCAGCGAT	CTGTCTATTT	CGTTCATCCA	7260
CAATGGTTAC	GAATTAGTCA	CTCCGTGGAT	AGAGTCGCTA	GACAGATAAA	GCAAGTAGGT	7260
TAGTTGCCTG	ACTCCCCGTC	GTGTAGATAA	CTACGATACG	GGAGGGCTTA	CCATCTGGCC	7320
ATCAACGGAC	TGAGGGGCAG	CACATCTATT	GATGCTATGC	CCTCCCGAAT	GGTAGACCGG	7320
CCAGTGCTGC	AATGATACCG	CGAGACCCAC	GCTCACCGGC	TCCAGATTTA	TCAGCAATAA	7380
GGTCACGACG	TACTATGGC	GCTCTGGGTG	CGAGTGGCCG	AGGTCTAAAT	AGTCGTTATT	7380
ACCAGCCAGC	CGGAAGGGCC	GAGCGCAGAA	GTGGTCCTGC	AACTTTATCC	GCCTCCATCC	7440
TGGTCGGTCG	GCCTTCCCGG	CTCGCGTCTT	CACCAGGACG	TTGAAATAGG	CGGAGGTAGG	7440
AGTCTATTAA	TTGTTGCCGG	GAAGCTAGAG	TAAGTAGTTC	GCCAGTTAAT	AGTTTGCGCA	7500
TCAGATAATT	AACAACGGCC	CTTCGATCTC	ATTCATCAAG	CGGTCAATTA	TCAAACGCGT	7500
ACGTTGTTGC	CATTGCTACA	GGCATCGTGG	TGTCACGCTC	GTCGTTTGGT	ATGGCTTCAT	7560
TGCAACAACG	GTAACGATGT	CCGTAGCACC	ACAGTGCGAG	CAGCAAACCA	TACCGAAGTA	7560
TCAGCTCCGG	TTCCCAACGA	TCAAGGCGAG	TTACATGATC	CCCCATGTTG	TGCAAAAAAG	7620
AGTCGAGGCC	AAGGGTTGCT	AGTTCCGCTC	AATGTACTAG	GGGGTACAAC	ACGTTTTTTC	7620
CGGTTAGCTC	CTTCGGTCCT	CCGATCGTTG	TCAGAAGTAA	GTTGGCCGCA	GTGTTATCAC	7680
GCCAATCGAG	GAAGCCAGGA	GGCTAGCAAC	AGTCTTCATT	CAACCGGCGT	CACAATAGTG	7680
TCATGGTTAT	GGCAGCACTG	CATAATTCTC	TACTGTGCAT	GCCATCCGTA	AGATGCTTTT	7740
AGTACCAATA	CCGTCGTGAC	GTATTAAGAG	AATGACAGTA	CGGTAGGCAT	TCTACGAAAA	7740
CTGTGACTGG	TGAGTACTCA	ACCAAGTCAT	TCTGAGAATA	GTGTATGCGG	CGACCGAGTT	7800
GACACTGACC	ACTCATGAGT	TGGTTCAGTA	AGACTCTTAT	CACATACGCC	GCTGGCTCAA	7800

FIG.12K



56/78

pICAST OMC

GCTCTTGCCC	GGCGTCAATA	CGGGATAATA	CCGCGCCACA	TAGCAGAACT	TTAAAAGTGC	7860
CGAGAACGGG	CCGCAGTTAT	GCCCTATTAT	GGCGCGGTGT	ATCGTCTTGA	AATTTTCACG	7860
TCATCATTGG	AAAACGTTCT	TCGGGGCGAA	AACTCTCAAG	GATCTTACCG	CTGTTGAGAT	7920
AGTAGTAACC	TTTTGCAAGA	AGCCCCGCTT	TTGAGAGTTC	CTAGAATGGC	GACAACTCTA	7920
CCAGTTCGAT	GTAACCCACT	CGTGCACCCA	ACTGATCTTC	AGCATCTTTT	ACTTTACCA	7980
GGTCAAGCTA	CATTGGGTGA	GCACGTGGGT	TGACTAGAAG	TCGTAGAAAA	TGAAAGTGGT	7980
GCGTTTCTGG	GTGAGCAAAA	ACAGGAAGGC	AAAATGCCGC	AAAAAAGGGA	ATAAGGGCGA	8040
CGCAAAGACC	CACTCGTTTT	TGTCCTTCCG	TTTTACGGCG	TTTTTCCCT	TATTCCCCT	8040
CACGGAAATG	TTGAATACTC	ATACTCTTCC	TTTTTCAATA	TTATTGAAGC	ATTTATCAGG	8100
GTGCCTTTAC	AACTTATGAG	TATGAGAAGG	AAAAAGTTAT	AATAACTTCG	TAAATAGTCC	8100
GTTATTGTCT	CATGAGCGGA	TACATATTTG	AATGTATTTA	GAAAAATAAA	CAAATAGGGG	8160
CAATAACAGA	GTA CTGCCT	ATGTATAAAC	TTACATAAAT	CTTTTATTT	GTTTATCCCC	8160
TTCCGCGCAC	ATTTC					8175
AAGGCGCGTG	TAAAG					8175

FIG. 12L



57/78

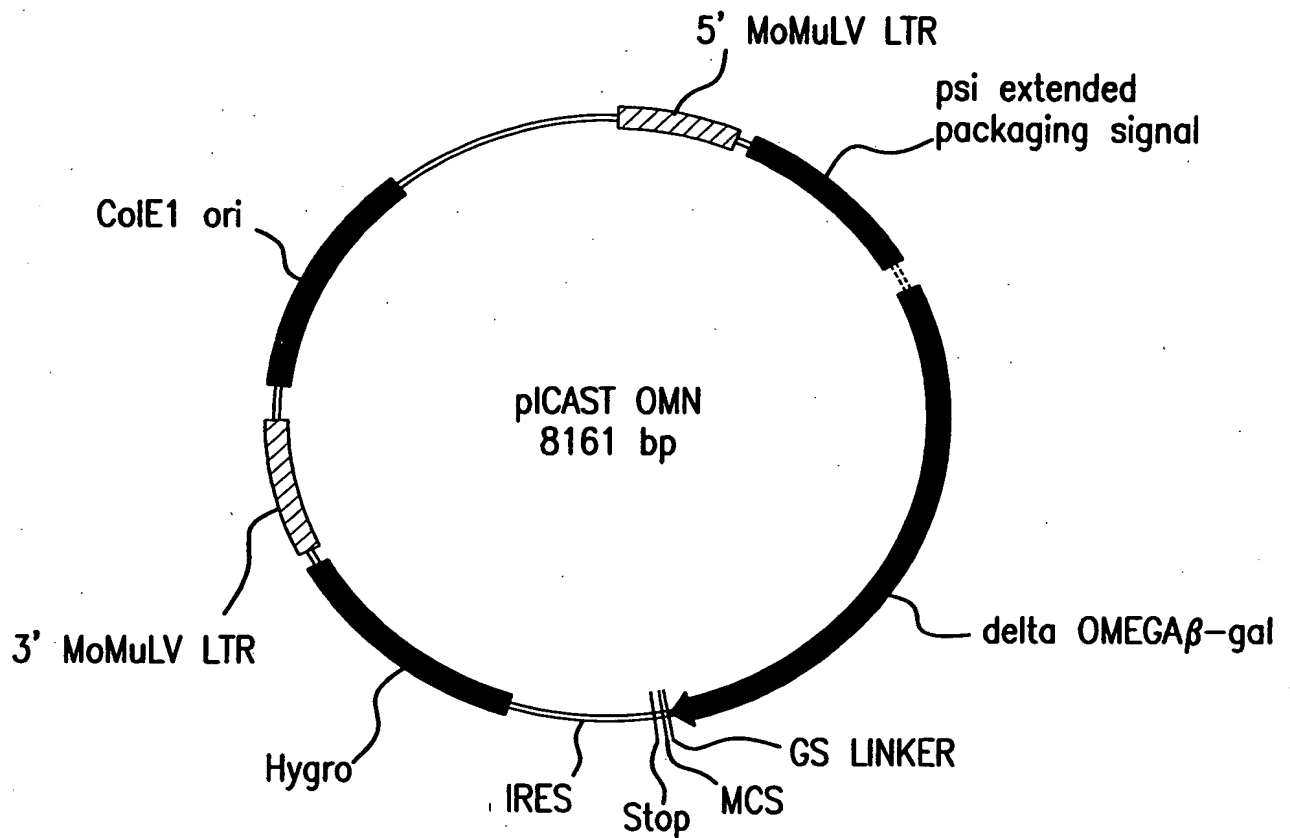


FIG.13A



58/78

pICAST OMN

CTGCAGCCTG	AATATGGGCC	AAACAGGATA	TCTGTGGTAA	GCAGTTCCTG	CCCCGGCTCA	60
GACGTCGGAC	TTATACCCGG	TTTGTCTAT	AGACACCATT	CGTCAAGGAC	GGGGCCGAGT	60
GGGCCAAGAA	CAGATGGAAC	AGCTGAATAT	GGGCCAAACA	GGATATCTGT	GGTAAGCAGT	120
CCCCGTTCTT	GTCTACCTTG	TCGACTTATA	CCCCGTTTGT	CCTATAGACA	CCATTCGTCA	120
TCCTGCCCCG	GCTCAGGGCC	AAGAACAGAT	GGTCCCCAGA	TGCGGTCCAG	CCCTCAGCAG	180
AGGACGGGGC	CGAGTCCCGG	TTCTTGTCTA	CCAGGGGTCT	ACGCCAGGTC	GGGAGTCGTC	180
TTTCTAGAGA	ACCATCAGAT	GTTTCCAGGG	TGCCCCAAGG	ACCTGAAATG	ACCCTGTGCC	240
AAAGATCTCT	TGGTAGTCTA	CAAAGGTCCC	ACGGGGTTCC	TGGACTTTAC	TGGGACACGG	240
TTATTTGAAC	TAACCAATCA	GTTTCGTTCT	CGTTTCTGTT	CGCGCGCTTC	TGCTCCCCGA	300
AATAAACTTG	ATTGGTTAGT	CAAGCGAAGA	GCGAAGACAA	GCGCGCGAAG	ACGAGGGGCT	300
GCTCAATAAA	AGAGCCCACA	ACCCCTCACT	CGGGGCGCCA	GTCCTCCGAT	TGACTGAGTC	360
CGAGTTATTT	TCTCGGGTGT	TGGGGAGTGA	GCCCCGCGGT	CAGGAGGCTA	ACTGACTCAG	360
GCCCCGGTAC	CCGTGTATCC	AATAAACCCCT	CTTGCAAGTTG	CATCCGACTT	GTGGTCTCGC	420
CGGGCCCATG	GGCACATAGG	TTATTTGGGA	GAACGTCAAC	GTAGGCTGAA	CACCAGAGCG	420
TGTTCTTTGG	GAGGGTCTCC	TCTGAGTGAT	TGACTACCCG	TCAGCGGGGG	TCTTTCATTT	480
ACAAGGAACC	CTCCCAGAGG	AGACTCACTA	ACTGATGGGC	AGTCGCCCCC	AGAAAGTAAA	480
GGGGGCTCGT	CCGGGATCGG	GAGACCCCTG	CCCAGGGACC	ACCGACCCAC	CACCGGGAGG	540
CCCCCGAGCA	GGCCCTAGCC	CTCTGGGGAC	GGGTCCCTGG	TGGCTGGGTG	GTGGCCCTCC	540
CAAGCTGGCC	AGCAACTTAT	CTGTGTCTGT	CCGATTGTCT	AGTGTCTATG	ACTGATTTTA	600
GTTTCGACCGG	TCGTTGAATA	GACACAGACA	GGCTAACAGA	TCACAGATAC	TGACTAAAAT	600
TGCGCCTGCG	TCGGTACTAG	TTAGCTAACT	AGCTCTGTAT	CTGGCGGACC	CGTGGTGGAA	660
ACGCGGACGC	AGCCATGATC	AATCGATTGA	TCGAGACATA	GACCGCCTGG	GCACCACCTT	660
CTGACGAGTT	CTGAACACCC	GGCCGCAACC	CTGGGAGACG	TCCCAGGGAC	TTTGGGGGCC	720
GACTGCTCAA	GACTTGTGGG	CCGGCGTTGG	GACCTCTGTC	AGGGTCCCTG	AAACCCCGG	720
GTTTTTGTGG	CCCGACCTGA	GGAAGGGAGT	CGATGTGGAA	TCCGACCCCG	TCAGGATATG	780
CAAAAACACC	GGGCTGGACT	CCTTCCCTCA	GCTACACCTT	AGGCTGGGGC	AGTCCTATAC	780

FIG. 13B



59/78

pICAST OMN

TGGTTCTGGT	AGGAGACGAG	AACCTAAAAC	AGTTCCCGCC	TCCGTCTGAA	TTTTTGCTTT	840
ACCAAGACCA	TCCTCTGCTC	TTGGATTTTG	TCAAGGGCGG	AGGCAGACTT	AAAAACGAAA	840
CGGTTTGGA	CCGAAGCCGC	GCGTCTTGTC	TGCTGCAGCA	TCGTTCTGTG	TTGTCTCTGT	900
GCCAAACCTT	GGCTTCGGCG	CGCAGAACAG	ACGACGTCGT	AGCAAGACAC	AACAGAGACA	900
CTGACTGTGT	TTCTGTATTT	GTCTGAAAAT	TAGGGCCAGA	CTGTTACCAC	TCCCTTAAGT	960
GACTGACACA	AAGACATAAA	CAGACTTTTA	ATCCCGGTCT	GACAATGGTG	AGGGAATTCA	960
TTGACCTTAG	GTAAGTGGAA	AGATGTCGAG	CGGCTCGCTC	ACAACCAGTC	GGTAGATGTC	1020
AACTGGAATC	CATTGACCTT	TCTACAGCTC	GCCGAGCGAG	TGTTGGTCAG	CCATCTACAG	1020
AAGAAGAGAC	GTTGGGTAC	CTTCTGCTCT	GCAGAATGGC	CAACCTTTAA	CGTCGGATGG	1080
TTCTTCTCTG	CAACCCAATG	GAAGACGAGA	CGTCTTACCG	GTTGGAAATT	GCAGCCTACC	1080
CCGCGAGACG	GCACCTTTAA	CCGAGACCTC	ATCACCCAGG	TTAAGATCAA	GGTCTTTTCA	1140
GGCGCTCTGC	CGTGGAAATT	GGCTCTGGAG	TAGTGGGTCC	AATTCTAGTT	CCAGAAAAGT	1140
CCTGGCCCCG	ATGGACACCC	AGACCAGGTC	CCCTACATCG	TGACCTGGGA	AGCCTTGGCT	1200
GGACCGGGCG	TACCTGTGGG	TCTGGTCCAG	GGGATGTAGC	ACTGGACCCT	TCGGAACCGA	1200
TTTGACCCCC	CTCCCTGGGT	CAAGCCCTTT	GTACACCCTA	AGCCTCCGCC	TCCTCTTCCT	1260
AACTGGGGG	GAGGGACCCA	GTTTCGGGAA	CATGTGGGAT	TCGGAGGCGG	AGGAGAAGGA	1260
CCATCCGCCC	CGTCTCTCCC	CCTTGAACCT	CCTCGTTCGA	CCCCGCCTCG	ATCCTCCCTT	1320
GGTAGGCGGG	GCAGAGAGGG	GGAACCTGGA	GGAGCAAGCT	GGGGCGGAGC	TAGGAGGGAA	1320
TATCCAGCCC	TCACTCCTTC	TCTAGGCGCC	GGCCGCTCTA	GCCCATTAAAT	ACGACTCACT	1380
ATAGGTCGGG	AGTGAGGAAG	AGATCCGCGG	CCGGCGAGAT	CGGGTAATTA	TGCTGAGTGA	1380
ATAGGGCGAT	TCGAACACCA	TGCACCATCA	TCATCATCAC	GTCGACGAAC	AGAAACTCAT	1440
TATCCCGCTA	AGCTTGTTGG	ACGTGGTAGT	AGTAGTAGTG	CAGCTGCTTG	TCTTTGAGTA	1440
TTCCGAAGAA	GACCTACTCG	AGATGGGCGT	GATTACGGAT	TCACTGGCCG	TCGTTTTACA	1500
AAGGCTTCTT	CTGGATGAGC	TCTACCCGCA	CTAATGCCTA	AGTGACCGGC	AGCAAAATGT	1500
ACGTCGTGAC	TGGGAAAACC	CTGGCGTTAC	CCAACCTAAT	CGCCTTGACG	CACATCCCCC	1560
TGCAGCACTG	ACCCTTTTGG	GACCGCAATG	GGTTGAATTA	GCGGAACGTC	GTGTAGGGGG	1560

FIG.13C



60/78

pICAST OMN

TTTCGCCAGC	TGGCGTAATA	GCGAAGAGGC	CCGCACCGAT	CGCCCTTCCC	AACAGTTACG	1620
AAAGCGGTCTG	ACCGCATTAT	CGCTTCTCCG	GGCGTGGCTA	GCGGGAAGGG	TTGTCAATGC	1620
CAGCCTGAAT	GGCGAATGGC	GCTTTGCCTG	GTTTCCGGCA	CCAGAAGCGG	TGCCGAAAG	1680
GTCGGACTTA	CCGCTTACCG	CGAAACGGAC	CAAAGGCCGT	GGTCTTCGCC	ACGGCCTTTC	1680
CTGGCTGGAG	TGCGATCTTC	CTGAGGCCGA	TACTGTCGTC	GTCCCCTCAA	ACTGGCAGAT	1740
GACCGACCTC	ACGCTAGAAG	GA CTCCGGCT	ATGACAGCAG	CAGGGGAGTT	TGACCGTCTA	1740
GCACGGTTAC	GATGCGCCCA	TCTACACCAA	CGTGACCTAT	CCCATTACGG	TCAATCCGCC	1800
CGTGCCAATG	CTACGCGGGT	AGATGTGGTT	GCACTGGATA	GGGTAATGCC	AGTTAGGCGG	1800
GTTTGTTCCTC	ACGGAGAATC	CGACGGGTTG	T TACTCGCTC	ACATTTAATG	TTGATGAAAG	1860
CAAACAAGGG	TGCCTCTTAG	GCTGCCCAAC	AATGAGCGAG	TGTAAATTAC	AACTACTTTC	1860
CTGGCTACAG	GAAGGCCAGA	CGCGAATTAT	TTTTGATGGC	GT TAACTCGG	CGTTTCATCT	1920
GACCGATGTC	CTTCCGGTCT	GCGCTTAATA	AAA ACTACCG	CAATTGAGCC	GCAAAGTAGA	1920
GTGGTGCAAC	GGGCGCTGGG	TCGGTTACGG	CCAGGACAGT	CGTTTGCCGT	CTGAATTTGA	1980
CACCACGTTG	CCGCGGACCC	AGCCAATGCC	GGTCCTGTCA	GCAAACGGCA	GACTTAAACT	1980
CCTGAGCGCA	TTTTTACGCG	CCGGAGAAAA	CCGCCTCGCG	GTGATGGTGC	TGCGCTGGAG	2040
GGACTCGCGT	AAAAATGCGC	GGCCTCTTTT	GGCGGAGCGC	CACTACCACG	ACGCGACCTC	2040
TGACGGCAGT	TATCTGGAAG	ATCAGGATAT	GTGGCGGATG	AGCGGCATTT	TCCGTGACGT	2100
ACTGCCGTCA	ATAGACCTTC	TAGTCCTATA	CACCGCCTAC	TCGCCGTAAA	AGGCACTGCA	2100
CTCGTTGCTG	CATAAACCGA	CTACACAAAT	CAGCGATTTT	CATGTTGCCA	CTCGCTTTAA	2160
GAGCAACGAC	GTATTTGGCT	GATGTGTTTA	GTCGCTAAAG	GTACAACGGT	GAGCGAAATT	2160
TGATGATTTT	AGCCGCGCTG	TACTGGAGGC	TGAAGTTCAG	ATGTGCGGCG	AGTTGCGTGA	2220
ACTACTAAAG	TCGGCGCGAC	ATGACCTCCG	ACTTCAAGTC	TACACGCCGC	TCAACGCACT	2220
CTACCTACGG	GTAACAGTTT	CTTTATGGCA	GGGTGAAACG	CAGGTCGCCA	GCGGCACCGC	2280
GATGGATGCC	CATTGTCAAA	GAAATACCGT	CCCACTTTGC	GTCCAGCGGT	CGCCGTGGCG	2280
GCCTTTCGGC	GGTGAAATTA	TCGATGAGCG	TGGTGGTTAT	GCCGATCGCG	TCACACTACG	2340
CGGAAAGCCG	CCACTTTAAT	AGCTACTCGC	ACCACCAATA	CGGCTAGCGC	AGTGTGATGC	2340

FIG.13D

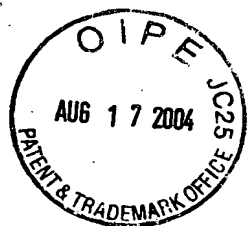


61/78

pICAST OMN

TCTGAACGTC	GAAAACCCGA	AACTGTGGAG	CGCCGAAATC	CCGAATCTCT	ATCGTGCGGT	2400
AGACTTGCAG	CTTTTGGGCT	TTGACACCTC	GCGGCTTTAG	GGCTTAGAGA	TAGCACGCCA	2400
GGTTGAACTG	CACACCGCCG	ACGGCACGCT	GATTGAAGCA	GAAGCCTGCG	ATGTCGGTTT	2460
CCAACTTGAC	GTGTGGCGGC	TGCCGTGCGA	CTAACTTCGT	CTTCGGACGC	TACAGCCAAA	2460
CCGCGAGGTG	CGGATTGAAA	ATGGTCTGCT	GCTGCTGAAC	GGCAAGCCGT	TGCTGATTCTG	2520
GGCGCTCCAC	GCCTAACTTT	TACCAGACGA	CGACGACTTG	CCGTTCCGGCA	ACGACTAAGC	2520
AGGCGTTAAC	CGTCACGAGC	ATCATCCTCT	GCATGGTCAG	GTCATGGATG	AGCAGACGAT	2580
TCCGCAATTG	GCAGTGCTCG	TAGTAGGAGA	CGTACCAGTC	CAGTACCTAC	TCGTCTGCTA	2580
GGTGCAGGAT	ATCCTGCTGA	TGAAGCAGAA	CAACTTTAAC	GCCGTGCGCT	GTTTCGCATTA	2640
CCACGTCCTA	TAGGACGACT	ACTTCGTCTT	GTTGAAATTG	CGGCACGCGA	CAAGCGTAAT	2640
TCCGAACCAT	CCGCTGTGGT	ACACGCTGTG	CGACCGCTAC	GGCCTGTATG	TGGTGGATGA	2700
AGGCTTGGTA	GGCGACACCA	TGTGCGACAC	GCTGGCGATG	CCGGACATAC	ACCACCTACT	2700
AGCCAATATT	GAAACCCACG	GCATGGTGCC	AATGAATCGT	CTGACCGATG	ATCCGCGCTG	2760
TCGGTTATAA	CTTTGGGTGC	CGTACCACGG	TTACTTAGCA	GACTGGCTAC	TAGGCGCGAC	2760
GCTACCGGCG	ATGAGCGAAC	GCGTAACGCG	AATGGTGCAG	CGCGATCGTA	ATCACCCGAG	2820
CGATGGCCGC	TACTCGCTTG	CGCATTGCGC	TTACCACGTC	GCGCTAGCAT	TAGTGGGCTC	2820
TGTGATCATC	TGGTCGCTGG	GGAATGAATC	AGGCCACGGC	GCTAATCACG	ACGCGCTGTA	2880
ACACTAGTAG	ACCAGCGACC	CCTTACTTAG	TCCGGTGCCG	CGATTAGTGC	TGCGCGACAT	2880
TCGCTGGATC	AAATCTGTCTG	ATCCTTCCCG	CCCGGTGCAG	TATGAAGGCG	GCGGAGCCGA	2940
AGCGACCTAG	TTTAGACAGC	TAGGAAGGGC	GGGCCACGTC	ATACTTCCGC	CGCCTCGGCT	2940
CACCACGGCC	ACCGATATTA	TTTGCCCGAT	GTACGCGCGC	GTGGATGAAG	ACCAGCCCTT	3000
GTGGTGCCGG	TGGCTATAAT	AAACGGGCTA	CATGCGCGCG	CACCTACTTC	TGGTCGGGAA	3000
CCCGGCTGTG	CCGAAATGGT	CCATCAAAAA	ATGGCTTTTCG	CTACCTGGAG	AGACGCGCCC	3060
GGGCCGACAC	GGCTTTACCA	GGTAGTTTTT	TACCGAAAGC	GATGGACCTC	TCTGCGCGGG	3060
GCTGATCCTT	TGCGAATACG	CCCACGCGAT	GGGTAACAGT	CTTGCGGGTT	TCGCTAAATA	3120
CGACTAGGAA	ACGCTTATGC	GGGTGCGCTA	CCCATTTGTCA	GAACCGCCAA	AGCGATTTAT	3120

FIG.13E



62/78

pICAST OMN

CTGGCAGGCG	TTTCGTCACT	ATCCCCGTTT	ACAGGGCGGC	TTCGTCTGGG	ACTGGGTGGA	3180
GACCGTCCGC	AAAGCAGTCA	TAGGGGCAAA	TGTCCCGCCG	AAGCAGACCC	TGACCCACCT	3180
TCAGTCGCTG	ATTAAATATG	ATGAAAACGG	CAACCCGTGG	TCGGCTTACG	GCGGTGATTT	3240
AGTCAGCGAC	TAATTTATAC	TACTTTTGCC	GTTGGGCACC	AGCCGAATGC	CGCCACTAAA	3240
TGGCGATACG	CCGAACGATC	GCCAGTTCTG	TATGAACGGT	CTGGTCTTTG	CCGACCGCAC	3300
ACCGCTATGC	GGCTTGCTAG	CGGTCAAGAC	ATACTTGCCA	GACCAGAAAC	GGCTGGCGTG	3300
GCCGCATCCA	GCGCTGACGG	AAGCAAAACA	CCAGCAGCAG	TTTTTCCAGT	TCCGTTTATC	3360
CGGCGTAGGT	CGCGACTGCC	TTCGTTTTGT	GGTCGTCGTC	AAAAAGGTCA	AGGCAAATAG	3360
CGGGCAAACC	ATCGAAGTGA	CCAGCGAATA	CCTGTTCCGT	CATAGCGATA	ACGAGCTCCT	3420
GCCC GTTTGG	TAGCTTCACT	GGTCGCTTAT	GGACAAGGCA	GTATCGCTAT	TGCTCGAGGA	3420
GCACTGGATG	GTGGCGCTGG	ATGGTAAGCC	GCTGGCAAGC	GGTGAAGTGC	CTCTGGATGT	3480
CGTGACCTAC	CACCGCGACC	TACCATTTCG	CGACCGTTTC	CCACTTCACG	GAGACCTACA	3480
CGCTCCACAA	GGTAAACAGT	TGATTGAACT	GCCTGAACTA	CCGCAGCCGG	AGAGCGCCGG	3540
GCGAGGTGTT	CCATTTGTCA	ACTAACTTGA	CGGACTTGAT	GGCGTCGGCC	TCTCGCGGCC	3540
GCAACTCTGG	CTCACAGTAC	GCGTAGTGCA	ACCGAACGCG	ACCGCATGGT	CAGAAGCCGG	3600
CGTTGAGACC	GAGTGTCATG	CGCATCACGT	TGGCTTGCGC	TGGCGTACCA	GTCTTCGGCC	3600
GCACATCAGC	GCCTGGCAGC	AGTGGCGTCT	GGCGGAAAAC	CTCAGTGTGA	CGCTCCCCGC	3660
CGTGTAGTCG	CGGACCGTCG	TCACCGCAGA	CCGCCTTTTG	GAGTCACACT	GCGAGGGGCG	3660
CGCGTCCCAC	GCCATCCCCG	ATCTGACCAC	CAGCGAAATG	GATTTTTGCA	TCGAGCTGGG	3720
GCGCAGGGTG	CGGTAGGGCG	TAGACTGGTG	GTCGCTTTAC	CTAAAAACGT	AGCTCGACCC	3720
TAATAAGCGT	TGGCAATTTA	ACCGCCAGTC	AGGCTTTCTT	TCACAGATGT	GGATTGGCGA	3780
ATTATTCGCA	ACCGTTAAAT	TGGCGGTCAG	TCCGAAAGAA	AGTGTCTACA	CCTAACCGCT	3780
TAAAAAACAA	CTGCTGACGC	CGCTGCGCGA	TCAGTTCACC	CGTGTCGATA	GATCTGGAGG	3840
ATTTTTTGTT	GACGACTGCG	GCGACGCGCT	AGTCAAGTGG	GCACAGCTAT	CTAGACCTCC	3840
TGGTGGCAGC	AGGCCTTGGC	GCGCCGGATC	CTTAATTAAC	AATTGACCGG	TAATAATAGG	3900
ACCACCGTCG	TCCGGAACCG	GCGGCGCTAG	GAATTAATTG	TTAACTGGCC	ATTATTATCC	3900

FIG.13F



63/78

pICAST OMN

TAGATAAGTG	ACTGATTAGA	TGCATTTCTGA	CTAGATCCCT	CGACCAATTC	CGGTTATTTT	3960
ATCTATTAC	TGACTAATCT	ACGTAAAGCT	GATCTAGGGA	GCTGGTTAAG	GCCAATAAAA	3960
CCACCATATT	GCCGTCTTTT	GGCAATGTGA	GGGCCCCGAA	ACCTGGCCCT	GTCTTCTTGA	4020
GGTGGTATAA	CGGCAGAAAA	CCGTTACACT	CCCGGGCCTT	TGGACCGGGA	CAGAAGAACT	4020
CGAGCATTCC	TAGGGGTCTT	TCCCCTCTCG	CCAAAGGAAT	GCAAGGTCTG	TTGAATGTCG	4080
GCTCGTAAGG	ATCCCCAGAA	AGGGGAGAGC	GGTTTCCTTA	CGTTCCAGAC	AACTTACAGC	4080
TGAAGGAAGC	AGTTCCTCTG	GAAGCTTCTT	GAAGACAAAC	AACGTCTGTA	GCGACCCTTT	4140
ACTTCCTTCG	TCAAGGAGAC	CTTCGAAGAA	CTTCTGTTTG	TTGCAGACAT	CGCTGGGAAA	4140
GCAGGCAGCG	GAACCCCCCA	CCTGGCGACA	GGTGCCTCTG	CGGCCAAAAG	CCACGTGTAT	4200
CGTCCGTCGC	CTTGGGGGGT	GGACCGCTGT	CCACGGAGAC	GCCGGTTTTT	GGTGCACATA	4200
AAGATACACC	TGCAAAGGCG	GCACAACCCC	AGTGCCACGT	TGTGAGTTGG	ATAGTTGTGG	4260
TTCTATGTGG	ACGTTTCCGC	CGTGTTGGGG	TCACGGTGCA	ACACTCAACC	TATCAACACC	4260
AAAGAGTCAA	ATGGCTCTCC	TCAAGCGTAT	TCAACAAGGG	GCTGAAGGAT	GCCCAGAAGG	4320
TTTCTCAGTT	TACCGAGAGG	AGTTCGCATA	AGTTGTTCCC	CGACTTCCTA	CGGGTCTTCC	4320
TACCCCATTTG	TATGGGATCT	GATCTGGGGC	CTCGGTGCAC	ATGCTTTACA	TGTGTTTAGT	4380
ATGGGGTAAC	ATACCCTAGA	CTAGACCCCG	GAGCCACGTG	TACGAAATGT	ACACAAATCA	4380
CGAGGTTAAA	AAACGTCTAG	GCCCCCGGAA	CCACGGGGAC	GTGGTTTTTC	TTTGAAAAAC	4440
GCTCCAATTT	TTTGAGATC	CGGGGGGCTT	GGTGCCCTG	CACCAAAGG	AACTTTTTTG	4440
ACGATGATAA	TACCATGAAA	AAGCCTGAAC	TCACCGCGAC	GTCTGTCGAG	AAGTTTCTGA	4500
TGCTACTATT	ATGGTACTTT	TTCGGACTTG	AGTGGCGCTG	CAGACAGCTC	TTCAAAGACT	4500
TCGAAAAGTT	CGACAGCGTC	TCCGACCTGA	TGCAGCTCTC	GGAGGGCGAA	GAATCTCGTG	4560
AGCTTTTCAA	GCTGTGCGAG	AGGCTGGACT	ACGTCGAGAG	CCTCCCGCTT	CTTAGAGCAC	4560
CTTTCAGCTT	CGATGTAGGA	GGGCGTGGAT	ATGTCCTGCG	GGTAAATAGC	TGCGCCGATG	4620
GAAAGTCGAA	GCTACATCCT	CCCGCACCTA	TACAGGACGC	CCATTTATCG	ACGCGGCTAC	4620
GTTTCTACAA	AGATCGTTAT	GTTTATCGGC	ACTTTGCATC	GGCCGCGCTC	CCGATTCCGG	4680
CAAAGATGTT	TCTAGCAATA	CAAATAGCCG	TGAAACGTAG	CCGGCGCGAG	GGCTAAGGCC	4680

FIG.13G



64/78

## pICAST OMN

AAGTGCTTGA	CATTGGGGAA	TTTAGCGAGA	GCCTGACCTA	TTGCATCTCC	CGCCGTGCAC	4740
TTCACGAACT	GTAACCCCTT	AAATCGCTCT	CGGACTGGAT	AACGTAGAGG	GCGGCACGTG	4740
AGGGTGTCAC	GTTGCAAGAC	CTGCCTGAAA	CCGAACTGCC	CGCTGTTCTG	CAGCCGGTGC	4800
TCCCACAGTG	CAACGTTCTG	GACGGACTTT	GGCTTGACGG	GCGACAAGAC	GTCGGCCAGC	4800
CGGAGGCCAT	GGATGCGATC	GCTGCGGCCG	ATCTTAGCCA	GACGAGCGGG	TTCGGCCCAT	4860
GCCTCCGGTA	CCTACGCTAG	CGACGCCGGC	TAGAATCGGT	CTGCTCGCCC	AAGCCGGGTA	4860
TCGGACCGCA	AGGAATCGGT	CAATACACTA	CATGGCGTGA	TTTCATATGC	GCGATTGCTG	4920
AGCCTGGCGT	TCCTTAGCCA	GTTATGTGAT	GTACCGCACT	AAAGTATACG	CGCTAACGAC	4920
ATCCCCATGT	GTATCACTGG	CAAACGTGTA	TGGACGACAC	CGTCAGTGCG	TCCGTCGCGC	4980
TAGGGGTACA	CATAGTGACC	GTTTGACACT	ACCTGCTGTG	GCAGTCACGC	AGGCAGCGCG	4980
AGGCTCTCGA	TGAGCTGATG	CTTTGGGCCG	AGGACTGCCC	CGAAGTCCGG	CACCTCGTGC	5040
TCCGAGAGCT	ACTCGACTAC	GAAACCCGGC	TCCTGACGGG	GCTTCAGGCC	GTGGAGCACG	5040
ACGCGGATTT	CGGCTCCAAC	AATGTCCTGA	CGGACAATGG	CCGCATAACA	GCGGTCATTG	5100
TGCGCCTAAA	GCCGAGGTTG	TTACAGGACT	GCCTGTTACC	GGCGTATTGT	CGCCAGTAAC	5100
ACTGGAGCGA	GGCGATGTTC	GGGGATTCCC	AATACGAGGT	CGCCAACATC	TTCTTCTGGA	5160
TGACCTCGCT	CCGCTACAAG	CCCCTAAGGG	TTATGCTCCA	GCGGTTGTAG	AAGAAGACCT	5160
GGCCGTGGTT	GGCTTGTATG	GAGCAGCAGA	CGCGCTACTT	CGAGCGGAGG	CATCCGGAGC	5220
CCGGCACCAA	CCGAACATAC	CTCGTCGTCT	GCGCGATGAA	GCTCGCCTCC	GTAGGCCTCG	5220
TTGCAGGATC	GCCGCGGCTC	CGGGCGTATA	TGCTCCGCAT	TGGTCTTGAC	CAACTCTATC	5280
AACGTCCTAG	CGGCGCCGAG	GCCCGCATAT	ACGAGGCGTA	ACCAGAACTG	GTTGAGATAG	5280
AGAGCTTGGT	TGACGGCAAT	TTCGATGATG	CAGCTTGGGC	GCAGGGTCGA	TGCGACGCAA	5340
TCTCGAACCA	ACTGCCGTTA	AAGCTACTAC	GTCGAACCCG	CGTCCCAGCT	ACGCTGCGTT	5340
TCGTCCGATC	CGGAGCCGGG	ACTGTCGGGC	GTACACAAAT	CGCCCGCAGA	AGCGCGGCCG	5400
AGCAGGCTAG	GCCTCGGCCC	TGACAGCCCG	CATGTGTTTA	GCGGGCGTCT	TCGCGCCGGC	5400
TCTGGACCGA	TGGCTGTGTA	GAAGTACTCG	CCGATAGTGG	AAACCGACGC	CCCAGCACTC	5460
AGACCTGGCT	ACCGACACAT	CTTCATGAGC	GGCTATCACC	TTTGCTGCG	GGGTCGTGAG	5460

FIG.13H





65/78

pICAST OMN

GTCCGAGGGC	AAAGGAATAG	AGTAGATGCC	GACCGGGATC	TATCGATAAA	ATAAAAGATT	5520
CAGGCTCCCG	TTTCCTTATC	TCATCTACGG	CTGGCCCTAG	ATAGCTATTT	TATTTTCTAA	5520
TTATTTAGTC	TCCAGAAAAA	GGGGGGAATG	AAGACCCCAA	CCTGTAGGTT	TGGCAAGCTA	5580
AATAAATCAG	AGGTCTTTTT	CCCCCTTAC	TTTCTGGGGT	GGACATCCAA	ACCGTTCGAT	5580
GCTTAAGTAA	CGCCATTTTG	CAAGGCATGG	AAAAATACAT	AACTGAGAAT	AGAGAAGTTC	5640
CGAATTCATT	GCGGTAAAAC	GTTCCGTACC	TTTTTATGTA	TTGACTCTTA	TCTCTTCAAG	5640
AGATCAAGGT	CAGGAACAGA	TGGAACAGCT	GAATATGGGC	CAAACAGGAT	ATCTGTGGTA	5700
TCTAGTTCCA	GTCCTTGTCT	ACCTTGTGCA	CTTATACCCG	GTTTGTCTTA	TAGACACCAT	5700
AGCAGTTCCT	GCCCCGGCTC	AGGGCCAAGA	ACAGATGGAA	CAGCTGAATA	TGGGCCAAAC	5760
TCGTCAAGGA	CGGGGCCGAG	TCCCGGTTCT	TGTCTACCTT	GTCGACTTAT	ACCCGGTTTG	5760
AGGATATCTG	TGGTAAGCAG	TTCCTGCCCC	GGCTCAGGGC	CAAGAACAGA	TGGTCCCCAG	5820
TCCTATAGAC	ACCATTCGTC	AAGGACGGGG	CCGAGTCCCG	GTTCTTGTCT	ACCAGGGGTC	5820
ATGCGGTCCA	GCCCTCAGCA	GTTTCTAGAG	AACCATCAGA	TGTTTCCAGG	GTGCCCCAAG	5880
TACGCCAGGT	CGGGAGTCGT	CAAAGATCTC	TTGGTAGTCT	ACAAAGGTCC	CACGGGGTTC	5880
GACCTGAAAT	GACCCTGTGC	CTTATTTGAA	CTAACCAATC	AGTTCGCTTC	TCGCTTCTGT	5940
CTGGACTTTA	CTGGGACACG	GAATAAACTT	GATTGGTTAG	TCAAGCGAAG	AGCGAAGACA	5940
TCGCGCGCTT	CTGCTCCCCG	AGCTCAATAA	AAGAGCCCAC	AACCCCTCAC	TCGGGGCGCC	6000
AGCGCGCGAA	GACGAGGGGC	TCGAGTTATT	TTCTCGGGTG	TTGGGGAGTG	AGCCCCGCGG	6000
AGTCCTCCGA	TTGACTGAGT	CGCCCGGGTA	CCCGTGTATC	CAATAAACCC	TCTTGCAGTT	6060
TCAGGAGGCT	AACTGACTCA	GCGGGCCCAT	GGGCACATAG	GTTATTTGGG	AGAACGTCAA	6060
GCATCCGACT	TGTGGTCTCG	CTGTTCCCTG	GGAGGGTCTC	CTCTGAGTGA	TTGACTACCC	6120
CGTAGGCTGA	ACACCAGAGC	GACAAGGAAC	CCTCCCAGAG	GAGACTCACT	AACTGATGGG	6120
GTCAGCGGGG	GTCTTTCATT	CATGCAGCAT	GTATCAAAT	TAATTTGGTT	TTTTTTCTTA	6180
CAGTCGCCCC	CAGAAAGTAA	GTACGTCGTA	CATAGTTTTA	ATTAAACCAA	AAAAAAGAAT	6180
AGTATTTACA	TTAAATGGCC	ATAGTTGCAT	TAATGAATCG	GCCAACGCGC	GGGGAGAGGC	6240
TCATAAATGT	AATTTACCGG	TATCAACGTA	ATTACTTAGC	CGGTTGCGCG	CCCCTCTCCG	6240

FIG. 131



66/78

pICAST OMN

GGTTTGCGTA	TTGGCGCTCT	TCCGCTTCCT	CGCTCACTGA	CTCGCTGCGC	TCGGTCGTTC	6300
CCAAACGCAT	AACCGCGAGA	AGGCGAAGGA	GCGAGTGACT	GAGCGACGCG	AGCCAGCAAG	6300
GGCTGCGGCG	AGCGGTATCA	GCTCACTCAA	AGGCGGTAAT	ACGGTTATCC	ACAGAATCAG	6360
CCGACGCCGC	TCGCCATAGT	CGAGTGAGTT	TCCGCCATTA	TGCCAATAGG	TGTCTTAGTC	6360
GGGATAACGC	AGGAAAGAAC	ATGTGAGCAA	AAGGCCAGCA	AAAGGCCAGG	AACCGTAAAA	6420
CCCTATTGCG	TCCTTTCTTG	TACACTCGTT	TTCCGGTCGT	TTCCGGTCC	TTGGCATTTT	6420
AGGCCGCGTT	GCTGGCGTTT	TTCCATAGGC	TCCGCCCCC	TGACGAGCAT	CACAAAAATC	6480
TCCGGCGCAA	CGACCGCAAA	AAGGTATCCG	AGGCGGGGGG	ACTGCTCGTA	GTGTTTTTAG	6480
GACGCTCAAG	TCAGAGGTGG	CGAAACCCGA	CAGGACTATA	AAGATACCAG	GCGTTTCCCC	6540
CTGCGAGTTC	AGTCTCCACC	GCTTTGGGCT	GTCCTGATAT	TTCTATGGTC	CGCAAAGGGG	6540
CTGGAAGCTC	CCTCGTGCGC	TCTCCTGTTC	CGACCCTGCC	GCTTACCGGA	TACCTGTCCG	6600
GACCTTCGAG	GGAGCACGCG	AGAGGACAAG	GCTGGGACGG	CGAATGGCCT	ATGGACAGGC	6600
CCTTTCTCCC	TTCGGGAAGC	GTGGCGCTTT	CTCATAGCTC	ACGCTGTAGG	TATCTCAGTT	6660
GGAAAGAGGG	AAGCCCTTCG	CACCGCGAAA	GAGTATCGAG	TGCGACATCC	ATAGAGTCAA	6660
CGGTGTAGGT	CGTTCGCTCC	AAGCTGGGCT	GTGTGCACGA	ACCCCCCGTT	CAGCCCGACC	6720
GCCACATCCA	GCAAGCGAGG	TTCGACCCGA	CACACGTGCT	TGGGGGGCAA	GTCGGGCTGG	6720
GCTGCGCCTT	ATCCGGTAAC	TATCGTCTTG	AGTCCAACCC	GGTAAGACAC	GACTTATCGC	6780
CGACGCGGAA	TAGGCCATTG	ATAGCAGAAC	TCAGGTTGGG	CCATTCTGTG	CTGAATAGCG	6780
CACTGGCAGC	AGCCACTGGT	AACAGGATTA	GCAGAGCGAG	GTATGTAGGC	GGTGCTACAG	6840
GTGACCGTCG	TCGGTGACCA	TTGTCCTAAT	CGTCTCGCTC	CATACATCCG	CCACGATGTC	6840
AGTTCTTGAA	GTGGTGGCCT	AACTACGGCT	ACACTAGAAG	AACAGTATTT	GGTATCTGCG	6900
TCAAGAACTT	CACCACCGGA	TTGATGCCGA	TGTGATCTTC	TTGTCATAAA	CCATAGACGC	6900
CTCTGCTGAA	GCCAGTTACC	TTCGGAAAAA	GAGTTGGTAG	CTCTTGATCC	GGCAAACAAA	6960
GAGACGACTT	CGGTCAATGG	AAGCCTTTTT	CTCAACCATC	GAGAACTAGG	CCGTTTGTTT	6960
CCACCGCTGG	TAGCGGTGGT	TTTTTTGTTT	GCAAGCAGCA	GATTACGCGC	AGAAAAAAG	7020
GGTGGCGACC	ATCGCCACCA	AAAAACAAA	CGTTCGTCGT	CTAATGCGCG	TCTTTTTTTC	7020

FIG.13J



67/78

pICAST OMN

GATCTCAAGA	AGATCCTTTG	ATCTTTTCTA	CGGGGTCTGA	CGCTCAGTGG	AACGAAAAC	7080
CTAGAGTTCT	TCTAGGAAAC	TAGAAAAGAT	GCCCCAGACT	GCGAGTCACC	TTGCTTTTGA	7080
CACGTTAAGG	GATTTTGGTC	ATGAGATTAT	CAAAAAGGAT	CTTCACCTAG	ATCCTTTTGC	7140
GTGCAATTCC	CTAAAACCAG	TACTCTAATA	GTTTTTCCTA	GAAGTGGATC	TAGGAAAACG	7140
GGCCGCAAAT	CAATCTAAAG	TATATATGAG	TAAACTTGGT	CTGACAGTTA	CCAATGCTTA	7200
CCGGCGTTTA	GTTAGATTTC	ATATATACTC	ATTTGAACCA	GACTGTCAAT	GGTTACGAAT	7200
ATCAGTGAGG	CACCTATCTC	AGCGATCTGT	CTATTTCTGT	CATCCATAGT	TGCCTGACTC	7260
TAGTCACTCC	GTGGATAGAG	TCGCTAGACA	GATAAAGCAA	GTAGGTATCA	ACGGACTGAG	7260
CCCGTCGTGT	AGATAACTAC	GATACGGGAG	GGCTTACCAT	CTGGCCCCAG	TGCTGCAATG	7320
GGGCAGCACA	TCTATTGATG	CTATGCCCTC	CCGAATGGTA	GACCGGGGTC	ACGACGTTAC	7320
ATACCGCGAG	ACCCACGCTC	ACCGGCTCCA	GATTTATCAG	CAATAAACCA	GCCAGCCGGA	7380
TATGGCGCTC	TGGGTGCGAG	TGGCCGAGGT	CTAAATAGTC	GTTATTTGGT	CGGTCGGCCT	7380
AGGGCCGAGC	GCAGAAGTGG	TCCTGCAACT	TTATCCGCCT	CCATCCAGTC	TATTAATTGT	7440
TCCCGGCTCG	CGTCTTCACC	AGGACGTTGA	AATAGGCGGA	GGTAGGTCAG	ATAATTAACA	7440
TGCCGGGAAG	CTAGAGTAAG	TAGTTCGCCA	GTTAATAGTT	TGCGCAACGT	TGTTGCCATT	7500
ACGGCCCTTC	GATCTCATT	ATCAAGCGGT	CAATTATCAA	ACGCGTTGCA	ACAACGGTAA	7500
GCTACAGGCA	TCGTGGTGTC	ACGCTCGTCG	TTTGGTATGG	CTTCATTGAG	CTCCGGTTCC	7560
CGATGTCCGT	AGCACCACAG	TGCGAGCAGC	AAACCATACC	GAAGTAAGTC	GAGGCCAAGG	7560
CAACGATCAA	GGCGAGTTAC	ATGATCCCCC	ATGTTGTGCA	AAAAAGCGGT	TAGCTCCTTC	7620
GTTGCTAGTT	CCGCTCAATG	TACTAGGGGG	TACAACACGT	TTTTTCGCCA	ATCGAGGAAG	7620
GGTCCTCCGA	TCGTTGTCAG	AAGTAAGTTG	GCCGCAGTGT	TATCACTCAT	GGTTATGGCA	7680
CCAGGAGGCT	AGCAACAGTC	TTCATTCAAC	CGGCGTCACA	ATAGTGAGTA	CCAATACCGT	7680
GCACTGCATA	ATTCTCTTAC	TGTCATGCCA	TCCGTAAGAT	GCTTTTCTGT	GACTGGTGAG	7740
CGTGACGTAT	TAAGAGAATG	ACAGTACGGT	AGGCATTCTA	CGAAAAGACA	CTGACCACTC	7740
TACTCAACCA	AGTCATTCTG	AGAATAGTGT	ATGCGGCGAC	CGAGTTGCTC	TTGCCCGGCG	7800
ATGAGTTGGT	TCAGTAAGAC	TCTTATCACA	TACGCCGCTG	GCTCAACGAG	AACGGGCCGC	7800

FIG.13K



68/78

pICAST OMN

TCAATACGGG	ATAATACCGC	GCCACATAGC	AGAACTTTAA	AAGTGCTCAT	CATTGGAAAA	7860
AGTTATGCCC	TATTATGGCG	CGGTGTATCG	TCTTGAAATT	TTCACGAGTA	GTAACCTTTT	7860
CGTTCTTCGG	GGCGAAACT	CTCAAGGATC	TTACCGCTGT	TGAGATCCAG	TTCGATGTAA	7920
GCAAGAAGCC	CCGCTTTTGA	GAGTTCCTAG	AATGGCGACA	ACTCTAGGTC	AAGCTACATT	7920
CCCACTCGTG	CACCCAACTG	ATCTTCAGCA	TCTTTTACTT	TCACCAGCGT	TTCTGGGTGA	7980
GGGTGAGCAC	GTGGGTTGAC	TAGAAGTCGT	AGAAAATGAA	AGTGGTCGCA	AAGACCCACT	7980
GCAAAAACAG	GAAGGCAAAA	TGCCGCAAAA	AAGGGAATAA	GGGCGACACG	GAAATGTTGA	8040
CGTTTTTGTC	CTTCCGTTTT	ACGGCGTTTT	TTCCCTTATT	CCCGCTGTGC	CTTTACAACT	8040
ATACTCATAC	TCTTCCTTTT	TCAATATTAT	TGAAGCATTT	ATCAGGGTTA	TTGTCTCATG	8100
TATGAGTATG	AGAAGGAAAA	AGTTATAATA	ACTTCGTAAA	TAGTCCCAAT	AACAGAGTAC	8100
AGCGGATACA	TATTTGAATG	TATTTAGAAA	AATAAACAAA	TAGGGGTTCC	GCGCACATTT	8160
TCGCCTATGT	ATAAACTTAC	ATAAATCTTT	TTATTTGTTT	ATCCCCAAGG	CGCGTGTAAG	8160
C						8161
G						8161

FIG.13L

69/78

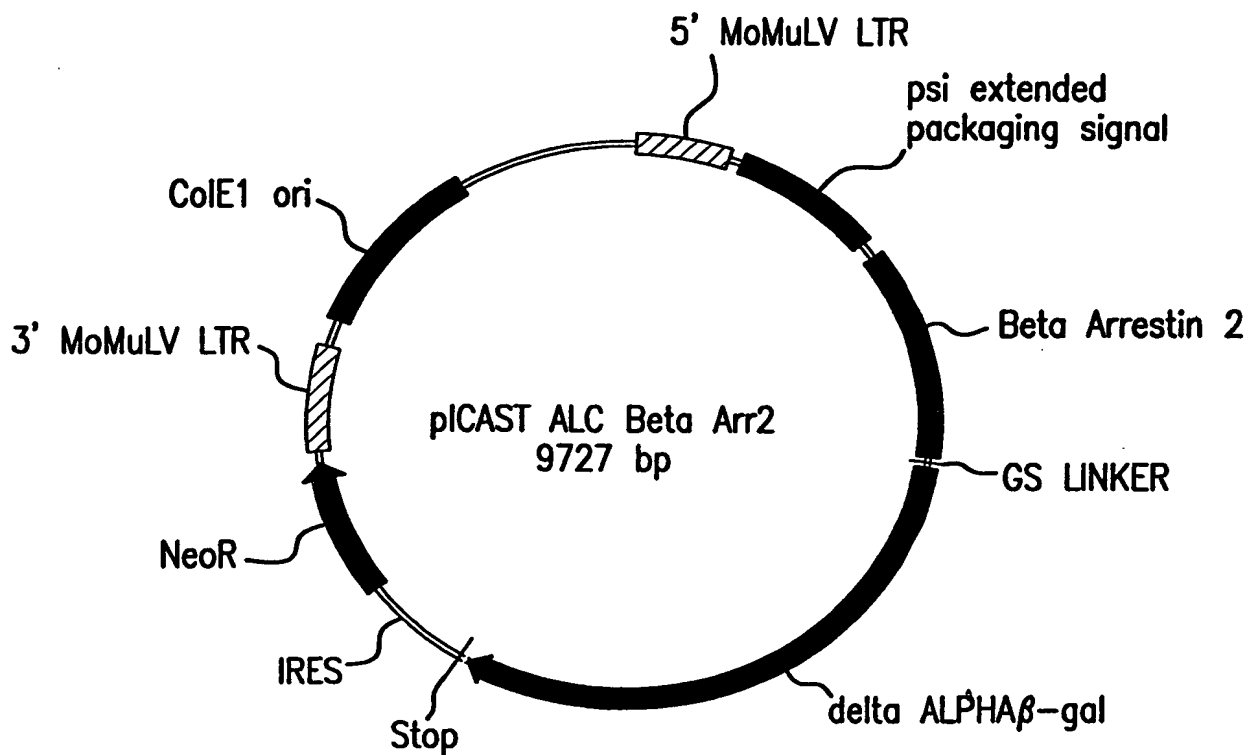


FIG.14

70/78

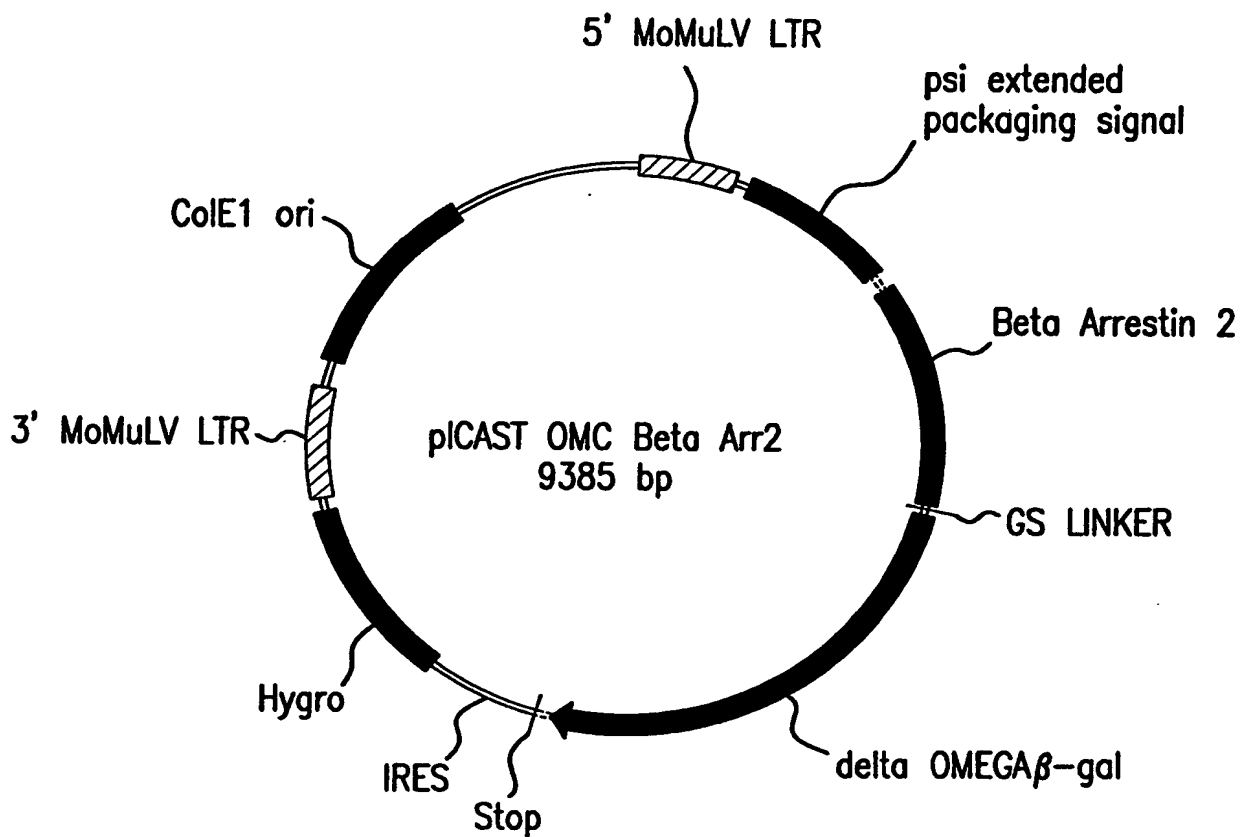


FIG.15



71/78

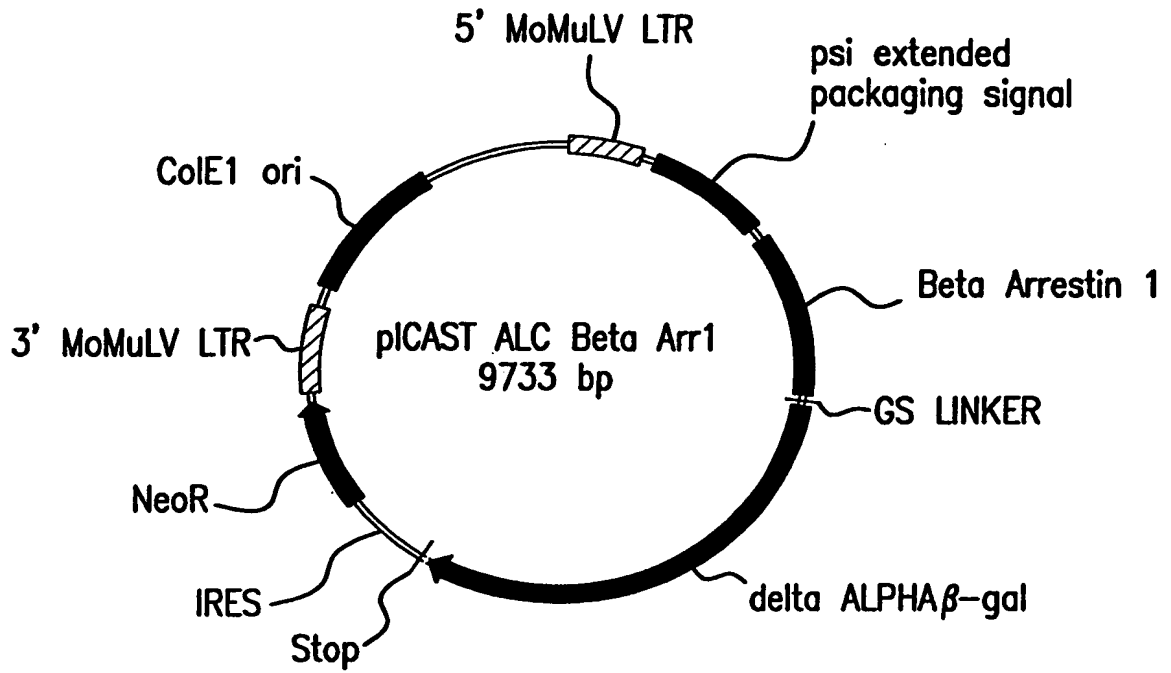


FIG.16

72/78

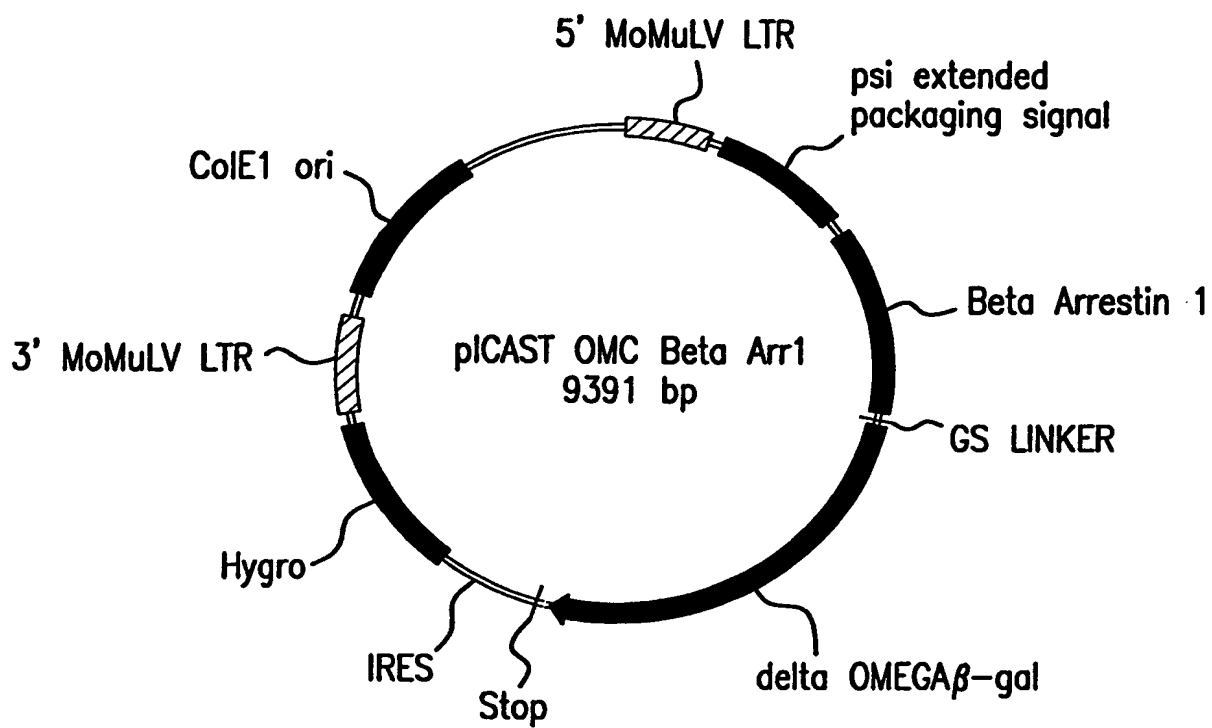


FIG.17



73/78

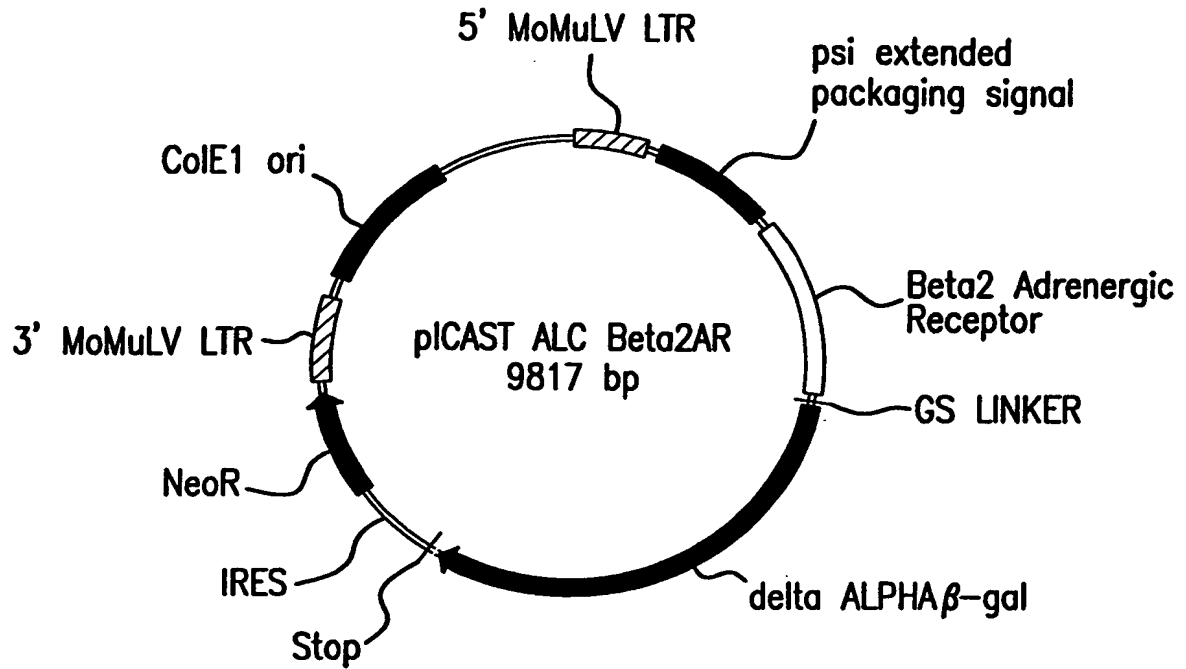


FIG.18

74/78

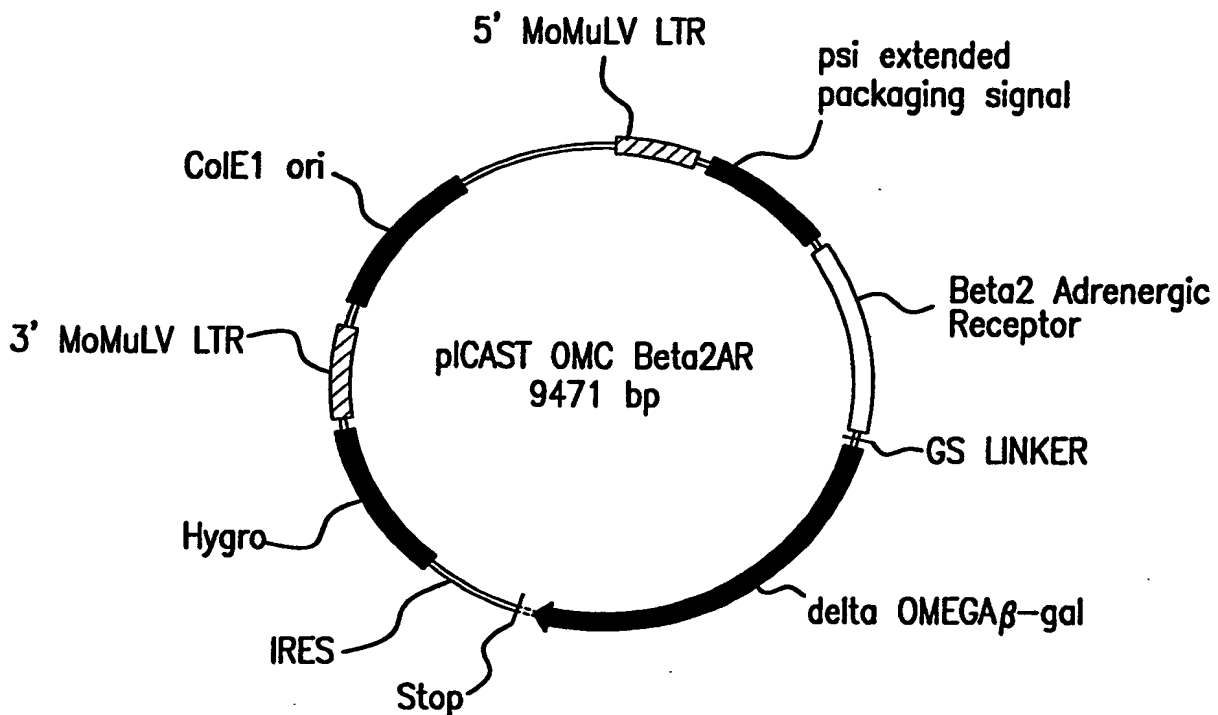


FIG.19

75/78

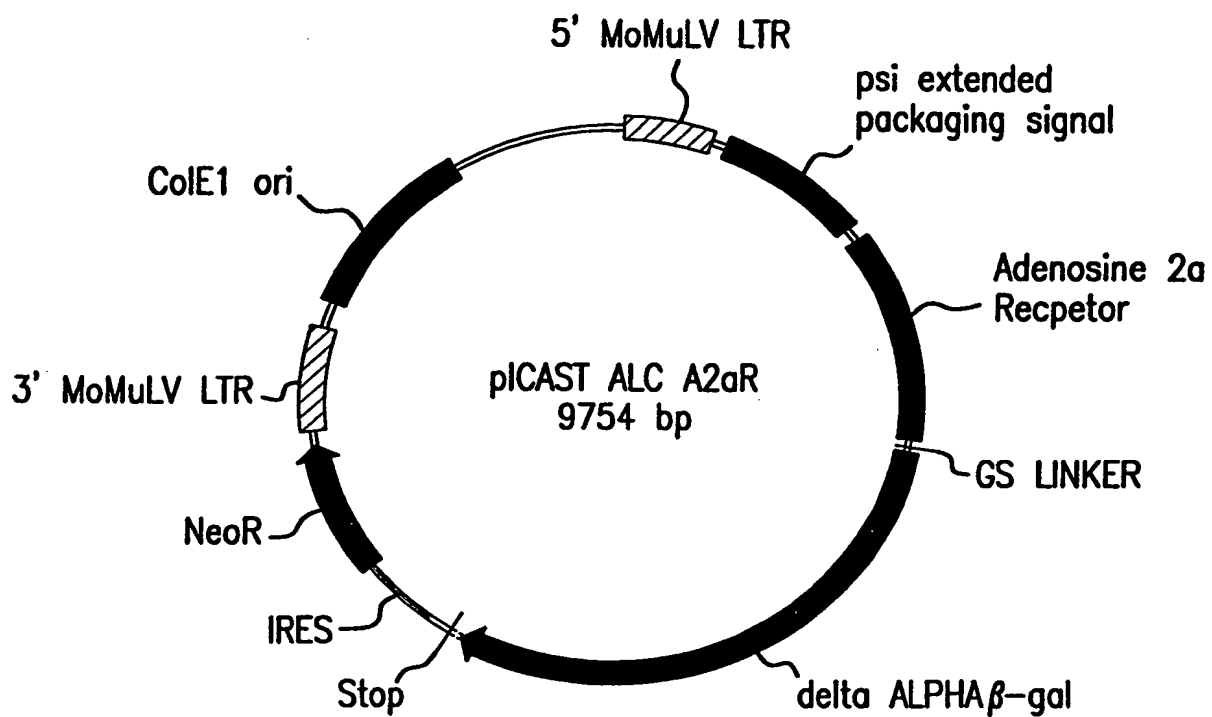


FIG.20

76/78

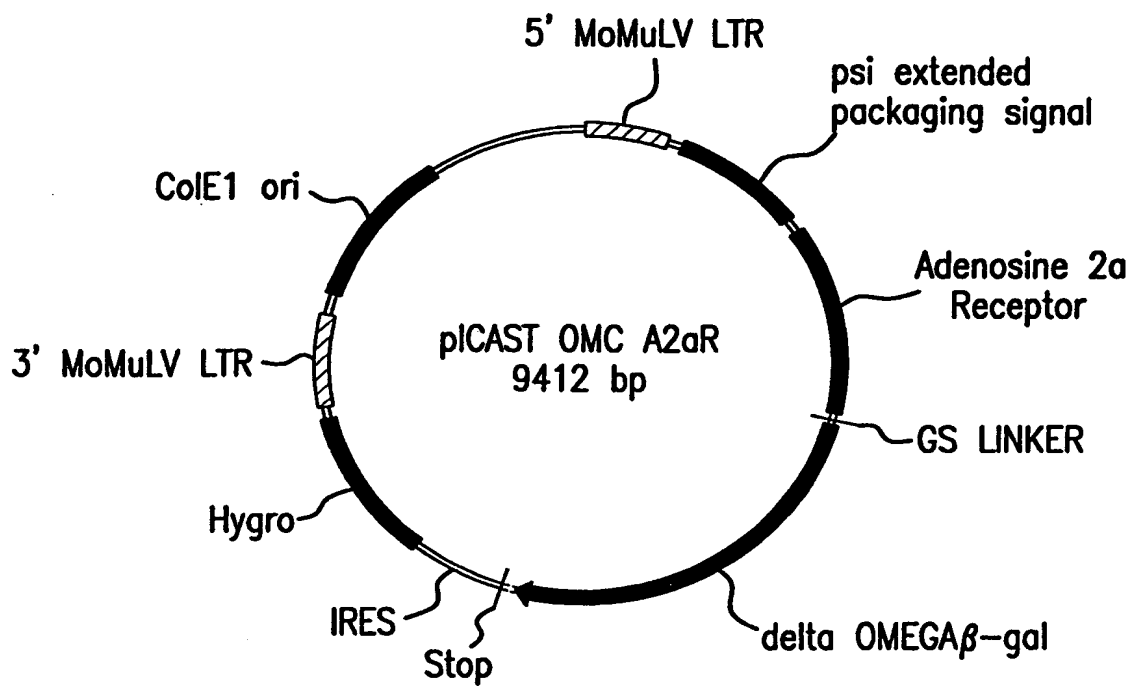


FIG.21

77/78

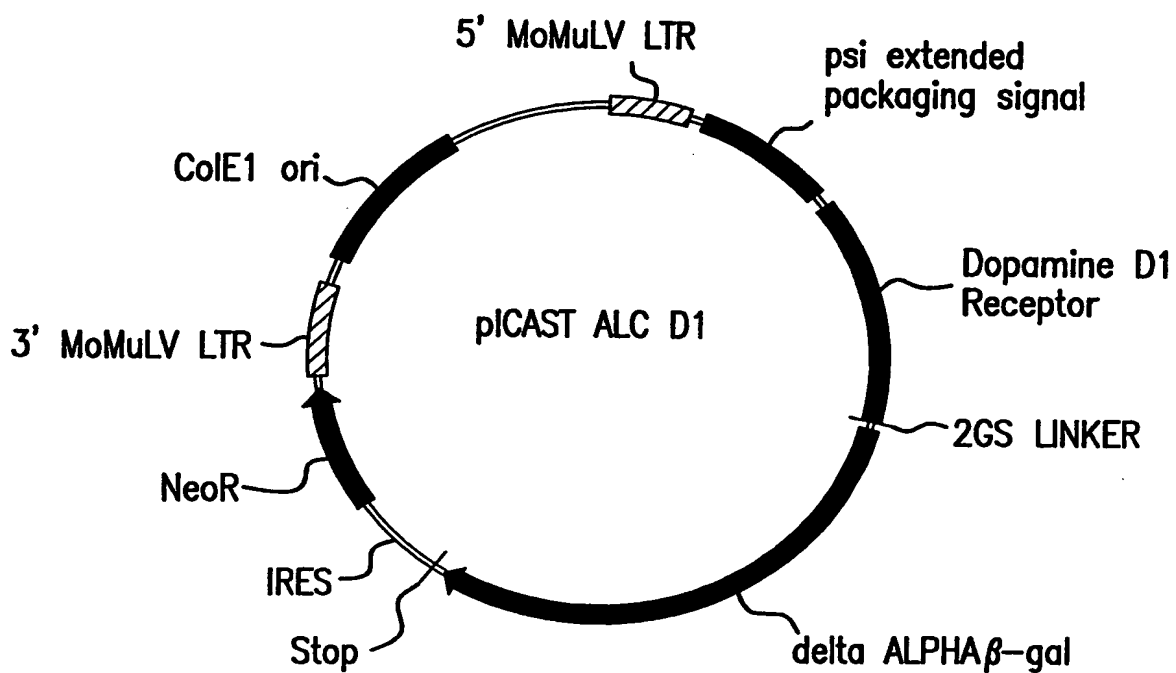
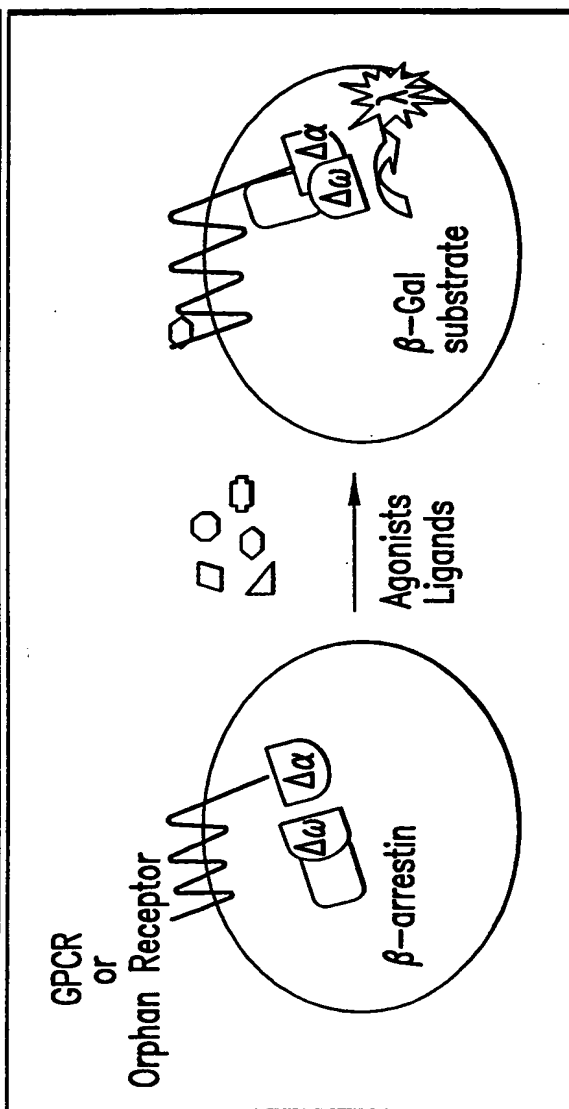


FIG.22

78/78

Functional GPCR Activation Assay and Ligand Fishing for Orphan Receptors  
by  $\beta$ -galactosidase mutant complementation in ICAS<sup>TM</sup> System



Examples

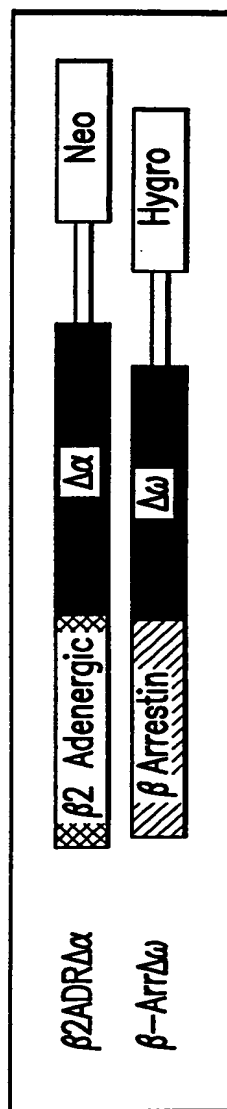


FIG. 23